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A new series of Inter-American Tests of General Ability and tests of Reading in parallel English and Spanish editions, has been developed for use in a variety of situations. The tests represent tools which may be used effectively throughout this hemsiphere wherever English or Spanish is spoken.

The tests were constructed from materials common to two cultures, making possible a comparison of abilities across linguistic and national borders. The materials were developed for use with elementary school children. Data on correlations with similar tests are included, as well as tentative norm data.

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ED001702

The Preparation and Evaluation of Inter-Language Testing Materials

Cooperative Research Project No. 681

HERSCHEL T. MANUEL

THE UNIVERSITY OF TEXAS

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THE PREPARATION AND EVALUATION OF INTER-LANGUAGE TESTING MATERIALS

Cooperative Research Project No. 681

Herschel T. Manuel

The University of Texas
Austin

1963

The research reported herein was supported by the Cooperative Research Program of the Office of Education, U. S. Department of Health, Education, and Welfare.

ACKNOWLEDGMENTS

This study has been a thoroughly cooperative project including literally hundreds of people—thousands if the students on whom the test materials have been tried are counted. I am deeply grateful for this assistance and regret that I cannot give credit here by name. A few will be mentioned in the text in connection with special studies.

Through its generous support, beginning with the assistance of Roy M. Hall, then Assistant Commissioner for Research, the Cooperative Research Program of the U. S. Office of Education made the study possible.

The University of Texas has cooperated fully from the time that the proposal for the research was first formulated. The Office of Government Sponsored Research of the University has given administrative supervision; the Testing and Counseling Center has cooperated in giving and scoring tests, in making materials available, and in statistical work; the Computation Center has rendered a large volume of statistical service, the greater part of it without compensation; the College of Education and my own department (Educational Psychology) have cooperated throughout the study; the Registrar has made convenient office space available even though rooms were scarce; the Printing Division and the Stenographic Bureau have been helpful in printing or duplicating the testing materials; and the Hogg Foundation has contributed to our staff and to printing the report. For special assistance I should mention my colleagues H. Paul Kelley, Clyde Inez Martin, James Knight, and María A. Swanson.

If one group could be singled out above others, it would be the Puerto Rican educators. The Inter-American Tests had their beginning in a study of the teaching of English as a cooperative project of the Committee on Modern Languages of the American Council on Education and the Department of Education of Puerto Rico. The Department of Education has continued that support through revision of the original series and through the present research. The Office of Evaluation—directed in turn by Pablo Roca, Charles O. Hamill, Clyde L. Fischer, and Miguelina N. de Hernández—approved the present project and carried a heavy load in administering and supervising the administration of the Spanish materials. At the University of Puerto Rico Ismael Rodríguez Bou, Juana Méndez, and Ishver S. Bangdiwala have given their assistance. In the private schools testing was supervised by Herbert E. Warfel, Sister Margaret Mary, and Sister Mary Daniel.

Guidance Testing Associates, Austin, Texas, contributed materials for administration of the Cooperative Inter-American Tests.

The American Institute for Research with the cooperation of John C. Flanagan, the supervision of John T. Dailey, and the participation of Stuart E. Sherman completed a special study in which equated scores were prepared for selected Inter-American and Project Talent Tests.

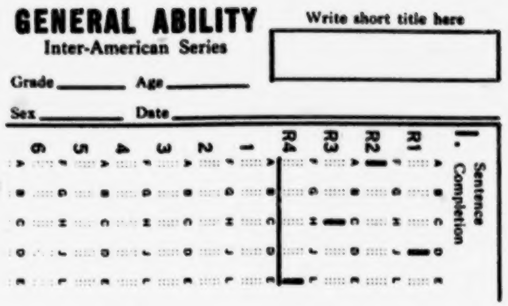
A large number of administrative officers, counselors, and teachers generously gave to the research the kind of assistance which a project of this nature requires in large quantity—the experimental administration of materials for the tests to be constructed and for the completed tests.

To the immediate project staff I owe a huge debt of gratitude for efficient and devoted service. Though not on the present staff, Franklin L. Stovall, a member of the staff which created the older Inter-American tests gave a measure of continuity from the old to the new by his assistance in test administration.

To all, my heartiest thanks.

Herschel T. Manuel

GENERAL ABILITY, LEVELS 3,4,5


GENERAL ABILITY
Inter-American Series
Write short title here
Grade
Age
Sex
Date
I. Sentence Completion
R1
R2
R3
R4
1
2
3
4
5
6

I. Sentence Completion

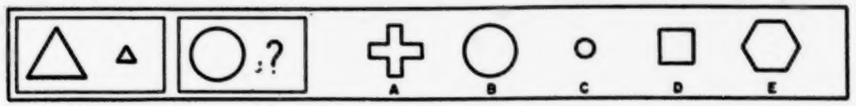
In each sentence find the word which has been left out.

The chain was so strong that it could not be __?__.

A sold B seen C heard
D broken E found

II. Analogies

In each row find the drawing which will make the second pair like the first pair.



III. Computation
In each problem find the right answer.

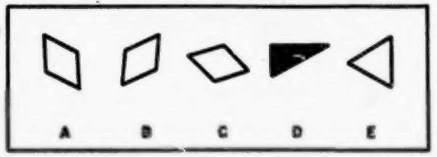
$$\begin{array}{r} 5 \\ \underline{+5} \end{array}$$

A 8
B 10
C 9
D 11
E None of these

IV. Word Relations
In each question find the word which completes the second pair.
hat head -- shoe __?__
A foot B table C box D lamp E tree

V. Classification (Example of Levels 4 and 5)

In each group of drawings find the one which does not go with the others.

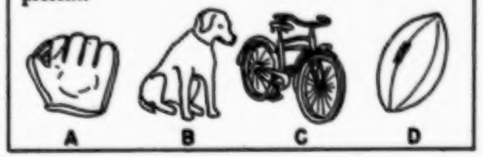


VI. Number Series
In each series of numbers find the number which comes next.
12 10 8 6 ?
F 4 G 5 H 7 J 8 L 3

SPEED OF READING

LEVEL 2

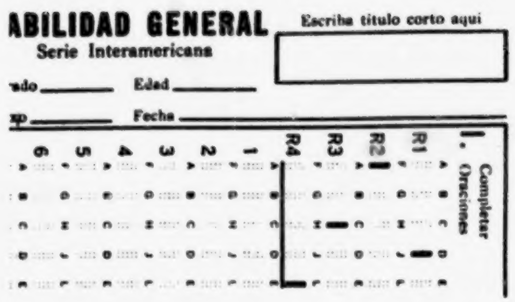
It was John's birthday, and his father bought him a present. His friends thought it was very beautiful. He will ride it to school. Which of the pictures is his present?



LEVELS 3, 4, 5

One reason for the choice of cloth in the production of books for infants is that cloth can be torn less easily than __?__.
A silk B cotton C metal
D paper E ribbon

HABILIDAD GENERAL, NIVELES 3,4,5


ABILIDAD GENERAL
Serie Interamericana
Escriba título corto aquí
ado
Edad
xp
Fecha
I. Completar Oraciones
R1
R2
R3
R4
1
2
3
4
5
6

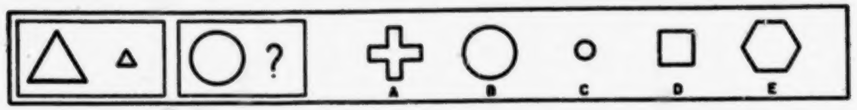
I. Completar Oraciones

En cada oración busquen la palabra que se ha omitido.

La cadena era tan fuerte que no se podía __?__.
A vender B ver C oír
D romper E encontrar

II. Analogías

En cada fila busquen el dibujo que hará el segundo par como el primer par.



III. Computación
En cada problema busquen la contestación correcta.

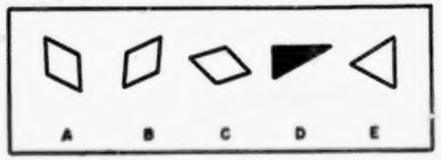
$$\begin{array}{r} 5 \\ \underline{+5} \end{array}$$

A 8
B 10
C 9
D 11
E Ninguno de éstos

IV. Relaciones entre Palabras
En cada pregunta busquen la palabra que completa el segundo par.
sombrero cabeza -- zapato __?__
A pie B mesa C caja D lámpara E árbol

V. Clasificación (Ejemplo de los Niveles 4 y 5)

En cada grupo de dibujos busquen el que no va con los otros.

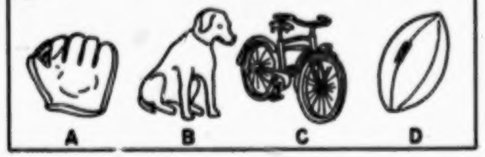


VI. Series Numéricas
En cada serie de números busquen el número que sigue.
12 10 8 6 ?
F 4 G 5 H 7 J 8 L 3

VELOCIDAD DE LECTURA

NIVEL 2

Era el cumpleaños de Juan y su papá le compró un regalo. Sus amigos pensaron que era muy bonita. El irá en ella a la escuela. ¿Cuál de los dibujos es el regalo?



NIVELES 3, 4, 5

Una razón para la selección de tela en la producción de libros para infantes es que la tela se puede romper menos fácilmente que (el) (la) __?__.
A seda B algodón C metal
D papel E cinta

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I

PROBLEM

As expressed in the title of the project, the purpose of this research is the preparation and evaluation of inter-language testing materials. The proposal for the study presented the problem in part in these words:

> The problem is to study and revise existing educational testing materials (specifically the Cooperative Inter-American Tests) and to create new materials in parallel English and Spanish editions for use in Spanish-speaking and English-speaking countries of the Americas. The end product will be a series of tests which will yield comparable results when administered in the Spanish edition to Spanish-speaking pupils and in the English edition to English-speaking pupils. The purpose is to provide means now lacking or imperfectly developed for comparing the abilities and educational achievements of pupils of different languages and cultures.... To achieve the greatest usefulness for the tests and to make the publication of the tests self-supporting after their production, the tests and accessory materials will be so constructed that they will give useful results when used in one language alone without any thought of comparing English and Spanish.

More specifically the expected outcome was a new Inter-American Series of tests in which the English and Spanish editions would have the same content except for the language used. The tentative plan was to limit the new series to general scholastic ability and reading, but to cover the range from the primary grades to the first year of college. The proposal included the preparation not only of test booklets but also of accessory materials for use in administering, scoring, interpreting, and evaluating the tests.

II

OBJECTIVES

The preparation of testing materials which yield comparable scores in English and Spanish, the immediate problem of the research, is directed toward three major objectives. The first of these is the improvement of international cooperation and communication in educational research and in the educative process. The results of psychological and educational measurement cannot be communicated adequately without common instruments or methods of equating the results obtained from the use of different instruments. Such comparable measures are commonplace in physical measurement. In the measurement of temperature, for example, workers can readily communicate across language barriers because the same thermometer scale (Fahrenheit or Centigrade) can be used by both; or, if different scales are used, the results of one can easily be translated into the units of the other. In psychological and educational measurement the means of such ready communication are lacking or imperfectly developed.

Committee B in the Report of the First International Conference on Educational Research (59:12), surveying the world need in 1956 found one of the "difficulties facing the extension and improvement of communication" in the field of educational research to be"the lack of common or comparable instruments, and of common or comparable systems of measurement, for assessing educational variables."

Discussing educational research in Latin American countries in the June, 1962, Review of Educational Research (48:249), Pablo Roca states that "a lack of communication among the research workers in the different countries...seems to be the greatest handicap to the development of educational research in Latin America...."

The second major objective in developing measuring instruments which yield comparable scores in English and Spanish is to provide comparable measures of ability and achievement in the bilingual situation—for example, when a school is educating children of different home languages or when the ability of the same person in two languages needs to be estimated. The long past of the human race has developed many languages because of the relative isolation of various groups through the centuries. Migration has now brought together in the same political unit or in the same community persons of different language, and the school must educate the children of these diverse peoples. Mastery of the physical environment has brought people into closer contact and increased the need for learning a second language.

Educating children of different languages and teaching a second language are worldwide problems but are especially acute in certain areas. To take an illustration outside of the field of immediate interest, South African educators have the problem of dealing with children whose home language is English, Afrikaans, German, or one of seven Bantu languages. The problem of comparing ability in English and Spanish is acute in areas where serious efforts are made to teach both languages, and in areas where migration has brought large numbers of Spanish-speaking children into schools in which English is the language of instruction. In Puerto Rico unusual efforts have been made for more than a half-century to teach English to its Spanish-speaking children. Into parts of the Continental United States migration has brought large numbers of Spanish-speaking children—notably New York City, Chicago, southern Florida, and the five states of the Southwest. In 1960 the Spanish-surname population of the Southwest was 11.8 per cent of the total.

The third objective in the study which has produced the new Inter-American Series of parallel tests in English and Spanish is to increase the supply of useful measuring instruments in each of the languages. The need for additional measuring instruments in English in the United States is less than the need for additional measuring instruments in Spanish in the Latin American countries, where psychological and educational testing is less advanced. But the use of the tests for communication across linguistic barriers and for comparison of ability in different languages will be greatly limited unless the Spanish tests are generally useful and widely used with Spanish-speaking children and the English tests with English-speaking children.

If a general hypothesis is needed to give the study an experimental setting, it is simply that useful tests can be produced in parallel English and Spanish editions by the methods employed in the study. Evidence on the degree to which this goal has been reached will be found in the materials themselves and in the statistical analysis of the results.

III

RELATED RESEARCH

The score on a test of ability or achievement is always influenced by variables other than the one which the tester is trying to measure. These disturbing variables are in the testing situation, the person tested, and the measuring instrument. Each of these in turn includes a number of factors which vary among themselves. The performance indicated by the test score represents the result of the interaction of all the variables in the situation. Thus A gets a score of 63 and B a score of 67, but no one knows how much of the difference between the two is the result of a difference in the ability being measured and how much is the result of other factors.

Variable and Constant Errors

Since some of the factors which influence the results of a test operate to raise the score at one time and to lower it at another, the true score is assumed to be the average of a large number of obtained scores. An obtained score is never more than an estimate of the true score. Nor can a true score be found by an statistical process. The best that can be done statistically is to estimate the magnitude of the errors to be expected in using the test.

The estimation of variable errors has had extensive study under the term reliability, and the literature needs no review here except a brief reference to support the measure of reliability—the correlation of alternate forms—which has been used most in this study. Frederick B. Davis reviewing "Testing and the Use of Test Results" in the Review of Educational Research (15: 11) summarizes an article by Cureton in which the use of this measure is favored (13):

> Cureton (1958) stated the logical foundations of the concept of reliability of measurement and critically examined methods for computing it. He concluded by recommending that the reliability coefficient of an objective test be estimated as the correlation coefficient between equivalent forms of the test administered at times separated by an interval judged optimal by the experimenter. Considerations involved in making this judgment were discussed. For tests of many functions, he suggested that the first of the equivalent forms be given on the morning of a day early in the week and that the second be given in the afternoon of a day late in the following week. He defined equivalent forms of a test as those having identical reliability coefficients and measuring the same mental functions. Finally, he indicated that, in his opinion, internal-consistency reliability coefficients, such as coefficient alpha, the various Kuder-Richardson coefficients, and split-half coefficients, greatly overestimate the practical reliability of tests.

More baffling are the variables which distort results in a single direction, constantly raising or lowering a score from the level which would be reached except for the disturbing factors. The content of the test itself, the type of response required, and the language in which it is written may favor one individual over another. Similarly, persisting attitudes and emotional factors may tend to raise or lower the performance of a person or group.

Differences in language and differences in other cultural factors make the construction of tests for use in different countries a hazardous undertaking. Some of the difficulties are obvious. For example, a child can understand verbal directions or content only in the language which he knows. Differences in units of measure are also obvious difficulties. A child who knows only Centigrade thermometer readings may find it difficult to deal with Fahrenheit units, which have values different from those to which he is accustomed in a given situation. Other differences, such as differences in the motivation of the children of different cultural groups, are more subtle and more difficult to deal with; yet they may profoundly influence the test results.

Tests having a large language content are often translated and adapted for use in a different language. The Binet intelligence scale, created to meet a specific need in France, is an excellent illustration. The prevailing practice has been to provide new norms. But unless one can assume that the abilities are equal in the populations on which the respective norms have been based, the question of the relative value of scores on the original test and the translated and adapted test remains unanswered.

Non-language and Cross-Cultural Tests

For the measurement of general mental ability where differences in language are a factor, the use of nonverbal material has been an enticing possibility. Thus the Army Beta Test of the First World War was constructed for use with persons who could not be measured adequately by a language test. Pintner and Paterson's Scale of Performance Test was constructed to obviate language difficulties in the measurement of mentality (43: 21):

> For all these groups of children—the foreign child, the speech defective, the deaf child and so on—a scale of performance tests is the only adequate means for the measurement of mentality.

Discussing performance and non-language tests, Anne Anastasi contrasts "most non-language tests" with "cross-cultural" tests (1). The difference is that many non-language tests include items which depend upon specific information on culturally linked objects or activities, and cross-cultural tests utilize only elements common to many cultures. The difference she recognizes is only one of degree. She questions also (p. 253) whether some non-language tests, such as the "current form of the Pintner Non-Language Test," depend too much on "spatial and perceptual functions, as contrasted to the symbolic manipulation of abstract relations, concepts, and factual information." Her discussion of cross-cultural tests includes: Leiter's International Performance Scale (35); Cattell's Culture Free Intelligence Test (10); Raven's Progressive Matrices (40); the Semantic Test of Intelligence developed at Harvard University (53); the Goodenough Draw-A-Man Test and the Harris-Goodenough Test of Psychological Maturity (25); and the Davis-Eells Games (14). (The references are from Anastasi's bibliography.)

The Davis-Eells Games were designed to be relatively free from the bias of social class in the same general culture. Evaluating the test Anastasi refers (p. 208) to the "common finding that lower-class children perform as poorly on this test as on other intelligence tests," and adds the statement that "the test seems to have sacrificed predictive validity without eliminating 'cultural bias'."

Nonverbal Reasoning Tests

Early in our test construction project, Charles T. Myers, of the Educational Testing Service, made a special study of the usefulness of nonverbal reasoning tests. The following is quoted from his report, and some of his references are listed in our bibliography:

> The simplest kind of judgment about the usefulness of nonverbal reasoning tests for educational uses is based on the correlation between such tests and school grades. Thirty-one such coefficients

> have been found in the course of this survey. They range from .05 to .67 with a median of .43. Half of these validity coefficients fell between .30 and .50. In general, then, these tests reported here had moderate validity for predicting school grades. Since these tests usually have only moderate correlations with verbal and mathematics aptitude tests, they can be expected to contribute to a multiple correlation prediction of grades by means of the three tests together. Whether their contribution is worth their cost is a matter which requires further information....
>
> A typical nonverbal reasoning test may be described as a test in which the item stems and answers are presented pictorially or diagramatically, and in which the problem is to find the concept by which the item may be solved, or to recognize the implications of combining concepts. Typical problem concepts concern size, shape, position, number, or style of drawing. Frequently the concepts are generalizations such as triangularity or closure. They are usually presented in terms of pictures of concrete objects, as for example a set of variously shaped triangular figures, rather than through coded symbols such as letters, numbers, or mathematical operation signs. Although the term, abstract reasoning, is sometimes applied to some of these tests, it is a little hard to justify this as a distinguishing feature. There are a great variety of forms of presentation and it may be inappropriate to try to define the term "nonverbal reasoning" since there has been so much variety and since the words "nonverbal" and "reasoning" are both very broad in meaning. Note that it is very probable that a good proportion of subjects use verbal reasoning in solving the problems and that most nonverbal test directions are presented verbally. Reasoning tests have been factor analyzed to show several vaguely defined factors....

The report includes illustrations of test items at this point: figure classification, figure series, figure matrix, figure analogies, incomplete pictures, and maze. Then it continues:

> These seem to be the most commonly used item types, but there are many others. The Davis-Eells Games include items presented in terms of pictures with spoken questions, frequently about social situations. The Primary Mental Abilities Tests include reasoning tests using letter symbols. The Kuhlmann-Anderson and the California Mental Maturity Nonlanguage Tests include a variety of partially pictorial or graphic items. Many tests use more than one item type. Presumably this has the good effect of lessening the error variance attributable to a single set of test directions.
>
> An item type which has not been considered in this survey is the Gottschaldt Hidden Figures Test. In this test a complex figure is used to conceal a smaller and simpler figure which must be found by the subject. Witkin has found this to be a good measure of "field independence," which is positively correlated with intelligence, and Thurstone has found this test to be a measure of a "closure" factor and somewhat correlated with spatial ability. How these tests should be classified and whether they are tests of reasoning or perception is somewhat doubtful. Another test that might be of interest is Rulon's Semantic Test of Intelligence. In this test, picture symbols are used for nouns and verbs, and sentences are constructed from these symbols....

The set of tests which we have presented may be classified in two ways, by type of symbol and by type of problem. The symbols used in presentation may be pictures of common objects, pictures of geometrical concepts (such as triangles, cubes, lines, or points), or coded symbols. For some problem types any of these presentations could be used, and in fact some tests combine two of these: for example, both pictures of objects and pictures of geometric figures used in the same figure analogies test. The type of problem may be classified as one of discovering a concept or of applying a concept. The concepts may be classified as concerning similarity, difference, incongruity, or perhaps some other concepts. Raven's Progressive Matrices and the Figure Analogies of the ACE Psychological Examination are two examples of what may be only a single type of problem. In both of these tests the subject must compare two (or more) geometric figures, find the difference and/or the similarity between them, and by applying this difference or similarity concept to a new figure arrive at an answer. The format and directions for these two tests differ, but we have no information to show that the mental process differs in any significant way. Somewhat similar to these is the Figure Series type of problem. These are presented in several different forms, but a typical form for these problems will show four figures each successively different from the preceding figure in a systematic progression,and the subject must find an answer figure that is suitable to come fifth in this progression. In this form there is little to differentiate this item type from an analogy except that the possibility for the next to the last figure is limited. However, this limitation permits these problems to be presented in a different way, in scrambled order, so that a new element is introduced, that of having to determine the correct order. In this format the subject must, presumably, be more creative in making and testing hypotheses about the concepts that relate the figures. It is plausible that there is a greater psychological difference between the two forms of Figure Series problems than there is between two item types with different names such as Figure Analogies and Figure Matrices. The evidence on such questions is neither extensive nor impressive.

It is also plausible that the Figure Classification item type requires the most abstract and creative thinking. This type was developed by Spearman as a measure of "g". The simplest form of this test presents a group of figures or pictures, all but one of which has some characteristic. The subject's task is to discover the characteristic and identify the figure that lacks the characteristic. An alternative presentation consists of two groups of figures, the first of these made up of figures all of which have the problem characteristic and the second of which is made up of figures all of which lack this characteristic. The subject is to pick one of several answer figures, the only one which belongs with the first group. This presentation is likely to be much less ambiguous than the first, but we have no evidence about the comparative validities of the two presentations. In the terminology of Guilford's "Structure of Intellect" we believe that either form of Figure Classification is a measure of "divergent thinking" and that Figure Matrix and Figure Analogies are measures of "convergent thinking."

There are several ways in which a nonverbal reasoning test might be judged to be valid. The test might be demonstrated to have a high correlation with some other, well-established measure of intelligence; or, better yet, it might be shown to be a useful predictor of academic success, the most common purpose for an intelligence test. This is the most obvious type of validity for these tests. As a predictor of academic success it would be most useful if it could supplement other predictors by having a low correlation with those predictors, primarily verbal tests of intelligence, and by having a high correlation with the criterion. Some psychologists have attempted to demonstrate the usefulness of nonverbal reasoning tests by showing that they had a high loading on a general factor in a test battery. Unfortunately, the importance of this characteristic is considerably mitigated by the thought that it is very possible that these tests are particularly effective measures of test-taking ability. Such characteristics as good pacing (knowing how much time to spend on a problem), shrewd guessing, good motivation, lack of worry in an unfamiliar situation, and a willingness and tendency to try to solve problems on the basis of only the given data (excluding subjective attitudes and experience), would probably be valuable in any group testing situation, but particularly valuable with nonverbal reasoning tests.

It is well known that maximum validity can be obtained by combining short, moderately valid, tests rather than by using one longer, more valid, test. It is also well known that lengthening a test will generally add much more to reliability than to validity. Hence, other things being equal, a complex battery of tests is generally to be preferred to a simple battery; but other things are not equal in most instances. The complex battery is more difficult to administer, often more expensive to produce, and may have other disadvantages. Complex batteries usually result in unreliable difference scores. However, statisticians are coming to be less skeptical of the usefulness of such unreliable difference scores. Non-statisticians are inclined to be more trusting of evidence when they know nothing about its reliability than when they know it has only moderate validity. This attitude is unrealistic. If teachers can learn appropriate ways of making tentative judgments on the basis of test scores, then batteries of tests with many short subtests will be more useful than they are now....

A good deal of the research done with nonverbal reasoning tests has been concerned, not with what they can be used to predict, but with studies of what these tests are free from. They have been designed to be free from the influence of general culture or free from specific academic training. At best they are only relatively free from such influences. Complete freedom would mean freedom from the influence of the culture on test motivation as well as freeing the symbols from the differential effects of differential familiarity. Neither of these things has been completely achieved although in some situations some success has been achieved. Unfortunately such freedom is purchased at an unknown cost. We do not know how valid are the elements that are minimized in such culture-free, non-academic, tests when our validity is related to culture-bound, academic, criteria. This problem must be considered in the light of the use to which these test results will be put....

> Perhaps the most important validity for a nonverbal reasoning test would be demonstrated if it were shown that these tests were useful in helping a teacher discover the best treatment for a particular student. One such use would be the indication of students who would profit from remedial reading instruction. Perhaps such treatment is indicated for students with low reading scores and high nonverbal reasoning scores, whereas it may not be indicated for students who score low on both. Such interpretations are plausible, but unfortunately this type of validity is more difficult to demonstrate. Wisdom in the use of these tests cannot precede experience in the use of these tests. Perhaps a good deal more has to be learned about the structure of intellect and the processes of teaching and learning before this type of validity can be put to proper use.
>
> A subjective analysis of nonverbal reasoning tests leads to the hypothesis that they are measures of a student's ability to learn by reasoning from a set of premises to a conclusion. This hypothesized characteristic is not too far from the common idea of intelligence. We might therefore imagine that these tests are a measure of ability in intelligent learning as compared with rote learning....

Tests for the Spanish-Speaking

Testing is much more highly developed in this country than in parts of the western hemisphere where Spanish is the native language. There is, however, a great deal of experimentation with tests in various parts of Latin America, and the interest is growing. As early as 1946 Béla Székely published Los Tests (56) presenting "for the first time in Spanish a collection of psychological tests." In 1948 the work was expanded into two volumes, describing tests from various countries, largely North American and European. Illustrative of Spanish-American tests described by Székely is the Test ABC developed in Brazil by Lourenço Filho (Manuel Bergström Lourenço) as a measure of the maturity necessary for learning to read and write. This test has been used in different countries, and in Venezuela has been studied recently by Francisco del Olmo, Juan José Espinoza, and Luis Azocar (17). Francisco del Olmo is himself the author of tests including one published by the Psychological Corporation, Test Rápido Barranquilla, a test of mental ability.

Puerto Rican educators have been quite active in the construction and use of tests. For many years the University of Puerto Rico has constructed its own admission tests. Recently both the Superior Educational Council and the Department of Education have had test-construction programs. Ismael Rodríguez Bou's monumental Estudio del Sistema Educativo de Puerto Rico (51:218-232) reports the results of tests used in that study. Pablo Roca's Escala de Inteligencia Wechsler para Niños is published by the Psychological Corporation. Miguelina N. de Hernández discusses measurement in Puerto Rico in the June 1962 Review of Educational Research (26:261-264). Ramón Ramírez López translated Allport-Vernon-Lindzey's Study of Values for use in a study of the values of Puerto Rican teachers, students of education, and other university students (45).

Parallel Tests in Two Languages

Although the construction of non-language testing materials for use with persons who speak different languages has long been a matter of experiment, the creation of parallel verbal materials for use in two languages is a relatively new procedure. The Inter-American Tests are an example of this technique, but not the sole example. The National Bureau of Educational and Social Research of South Africa is now experimenting with a test in which "the verbal items in the Afrikaans and English editions are translations or adaptations of each other, while the nonverbal items are, to all appearances, the same" (20). (Dr. H. P. Langenhoven, of the Bureau, spent several weeks in our project making a careful study of the problems of inter-group testing.) With a reading and an arithmetic test as criteria of item validity in preliminary tests, the Bureau found "that the very items which had the highest validity for both English and Afrikaans pupils differed least in degree of difficulty." Moreover, "there was ample opportunity to select items which discriminated between those who did well and those who did badly in the test as a whole, in the reading test and in the arithmetic test" (p.8).

Pablo Roca (50) explored the possibility of an interest inventory for students of different language and culture, concluding that "it is possible to construct an interest inventory that will give comparable results when administered to high school students of different linguistic and cultural backgrounds."

The construction of parallel tests in two languages is based on the assumption that at one time or another each test will be used to measure ability in a second language. Here the problems are both linguistic and cultural. Three articles in the Third Edition of the Encyclopedia of Educational Research provide helpful summaries of research in related fields: "Bilingualism" (36:146-150) by Herschel T. Manuel; "English as a Second Language" (30:478-482) by Joseph Kavetsky and J. Cayce Morrison; "Modern Languages" (6:861-888) by Emma M. Birkmaier. Robert Lado has contributed a notable volume on Language Testing: The Construction and Use of Foreign Language Tests (34).

Cooperative Inter-American Tests

The Cooperative Inter-American Tests had their origin in a study of the teaching of English in Puerto Rico by Robert Herndon Fife and Herschel T. Manuel under the auspices of the Committee on Modern Languages of the American Council on Education (22). The second part of their report to the American Council describes the tests and presents the results of their administration in the study.

Although the Puerto Rican study was concerned directly with the teaching of English, the investigators thought it desirable to have comparable tests in Spanish and to include nonverbal tests in the program (p.177):

> There were compelling reasons for including Spanish also. In the first place, a knowledge of achievement in Spanish forms a background for a better understanding of achievement in English. The curve of learning a second language acquires additional meaning when it is projected against the curve of learning the first language. The Committee was interested also in total language development. Students of bilingualism need to know more than is now known concerning the effects of two languages upon each other and of the effect of the total program upon linguistic development as a whole. It could be that under certain circumstances the attempt to learn two languages would result in learning neither effectively. On the other hand, it might be found that under other circumstances each would strengthen and support the other. The close relation of language to thinking gives increased emphasis to the need for considering total language development.
>
> Tests of general ability, largely non-verbal, were included in the program. It was thought that something significant might be found in the comparison of curves of development in verbal and non-verbal areas and that non-verbal tests would be of practical value in acquainting pupils with the testing situation before the tests of major interest were introduced.

Comparability of scores in Spanish and English seemed basic to the study (pp.177-178):

> Achievement in English could be compared with achievement in Spanish with the desired accuracy only if we had tests in the two languages so constructed and so calibrated that the scores in one language could we equated with the scores in the other.
>
> The Committee desired also to be able to compare abilities in the Puerto Rican situation with abilities in monolingual areas. Specifically, it was felt that it would help a great deal in interpreting results in Puerto Rico if the achievement there in both English and Spanish could be compared with achievement in English in the continental United States and with achievement in Spanish in Mexico.

The committee rejected the possibility of using translations of tests which had been originally constructed for a single language and culture, and set itself to the task of creating new tests with the assistance of a joint staff of Spanish-speaking and English-speaking educators. The possible international significance of the work was foreseen (p.179):

> The plan to build a series of tests yielding comparable results in English and Spanish was supported not only by the desire for satisfactory tools in the Puerto Rican study but also by the thought that such a series could be extremely useful in other areas. The exchange of information between educators of Spanish-speaking and English-speaking countries would be greatly expedited if comparable tests were used in the schools. Providing a common language for workers in different countries, the tests might make a significant contribution to international cooperation and friendship.

The tests produced for the Puerto Rican study included:

1. Tests of General Ability: Primary, Intermediate, and Advanced, Forms A and B, with identical test material for the English and Spanish editions.

2. Reading, general: Primary, Intermediate, and Advanced, Forms A and B, English and Spanish editions.

3. Reading in subject-matter fields: Tests of Vocabulary and Interpretation of Reading Materials in the Natural Sciences, Forms A and B, English and Spanish editions; Tests of Vocabulary and Interpretation of Reading Materials in the Social Studies, Forms A and B, English and Spanish editions.

4. Language Usage: Tests of Active Vocabulary and Expression, Forms A and B, English and Spanish editions.

Experience with the tests in the Puerto Rican study and the interest of others in the tests led to their revision and publication for general use (p.vi):

> As the bilingual battery became known, requests for the tests came from various agencies and individuals interested in cultural relations with Latin America. In response to this evidence of interest, coming also from some of the Latin American countries, the Committee on Measurement and Guidance of the American Council on Education voted in November, 1946, to publish the entire series of tests through the Cooperative Test Service, now a part of the

> Educational Testing Service. Persistent study of the returns at Austin had shown the necessity for revision of certain items and the substitution and addition of others, and the staff under Manuel's direction effected a thorough-going revision of the battery, which was finally published in 1950.

The Cooperative Inter-American Tests, as the published series was called, were distributed for a number of years by the Educational Testing Service. But lacking a vigorous program of developing additional interpretative materials and promoting their use, ETS found only a limited demand for the tests. The tests were discontinued by ETS and given to Guidance Testing Associates (Austin, Texas), a non-profit educational corporation organized (1959) to continue the tests and keep alive for further experimentation the concept of parallel tests in different languages.

In March, 1959, the University of Texas presented a proposal to the Cooperative Research Program of the Office of Education, Department of Health, Education, and Welfare, for the "preparation and evaluation of inter-language testing materials," with Herschel T. Manuel as the "principal investigator," and with favorable action by the Office of Education the present research began the following September.

Research on the Inter-American Tests

No general norms for the Cooperative Inter-American Tests have been published to replace the tentative norms included in the 1950 Examiner's Manual. In 1952 the Puerto Rican Department of Public Instruction issued norms for Form AS (Spanish) of all of the tests and for Form BE of the Test of Language Usage (mimeographed report). In 1960 the Department issued a mimeographed Boletín de Información (Núm.3) containing revised norms for Form AS of the Tests of General Ability and Reading for the seventh and ninth grades.

The Bureau of Educational Research of the New York City Schools, under the direction of J. Wayne Wrightstone, has made careful studies of the use of the Primary and Intermediate levels of the Cooperative Inter-American Tests of General Ability with Spanish-speaking pupils from Puerto Rico. The evolution of the program for testing these pupils is described in a mimeographed report prepared by Georgiana January (27). The report includes findings based upon the administration in Spanish of the Primary Level Tests to 6,418 seven- and eight-year-old pupils in the second grade of 55 elementary schools, and the Intermediate Level Tests to 2,813 pupils in 11 elementary schools and 27 junior high schools, grades 5 through 9. Among the findings are these:

Primary Level, Form AS (p. 19 of report):

> A significant difference was found between the mean score of the seven-year-old pupils and the mean score of the eight-year-old group. When groups were separated according to sex, no significant differences were found.
>
> When pupils were rated by their teachers in three broad categories (Bright, Average, Slow) an increase in mean score accompanied successively higher intelligence levels. Overlapping between groups was apparent.
>
> A similar increase in mean scores occurred when pupils were rated by their teachers according to their knowledge of English (Good, Limited, Practically None). Here, too, overlapping between groups was evident.
>
> Up to three years of residence, a rise in mean score accompanied yearly increments in the length of time those pupils had lived in

> New York City. After three years no increases in mean scores were found.
>
> Test results were similarly affected by varying amounts of attendance in New York City schools. Mean scores rose at both age levels each year as the amount of school attendance increased.
>
> Substantial positive correlations were found between the primary level of the CIA Tests of General Ability and between several other intelligence tests used in New York City on a citywide basis.
>
> Percentile norms for ages seven and eight years have reached the point where they remain stable as new cases are added.

Intermediate Level, Form AS (p.20):

> As the numbers of pupils tested increased, early indications that this test does not discriminate adequately between age levels above 12 years were confirmed.
>
> Differences between mean scores of groups separated according to sex showed no statistical significance.
>
> Increases in mean scores accompanied successively higher mental ability ratings when pupils were grouped according to teachers' estimates of intelligence. Overlapping between groups was apparent.
>
> Although the tests were administered in Spanish, mean scores rose as command of English increased.
>
> Increments in years of residence in New York City were not accompanied by a corresponding rise in mean score until after two years, when a small but significant change was noted.
>
> Approximately the same rise in mean score occurred after two years of school experience in New York City. However, higher mean scores were consistently associated with increments in the number of years spent in Puerto Rican schools.

The general evaluation of the tests was favorable (p.21):

> Up to the present time, the two Cooperative Inter-American Tests of General Ability, Primary Level, Form AS, and Intermediate Level, Form AS, are the most satisfactory of the instruments investigated by the Bureau of Educational Research for measuring the ability of Spanish-speaking pupils from Puerto Rico. That each test has its limitations and is affected to some degree by cultural differences and school experience has been demonstrated by the foregoing analyses of test results. However, both tests have proved to have value as an additional factor, used in conjunction with the teacher's judgment, upon which to base an estimate of the ability of the Spanish-speaking child.

A later study, also prepared by Mrs. January, reports the results of a limited use of the CIA Intermediate Level Tests with Spanish-speaking pupils in academic and vocational senior high schools (28). The results seemed to indicate that the tests of this level would be useful in the senior high school, but the possibility was suggested that the Advanced Level Tests might be a better selection. No trial of this possibility had been made. The Appendix contains revised percentile norms for the Intermediate Level Tests, Form AS, for pupils of age 12 and above, norms based on experimental testing programs in the junior high schools.

Ismael Rodríguez Bou studied the parallelism of the English and Spanish vocabularies of the Intermediate and Advanced Tests of the 1943 Inter-American Tests (52). Evidence of parallelism was drawn from four sources: (1) the extent to which corresponding English and Spanish words are listed by Eaton at the same level of frequency and as expressing similar thought content in her Semantic Frequency List (19); (2) a comparison of frequency of use of the English words according to the Thorndike list (57) and the frequency of use of the Spanish words according to the Buchanan list (8); (3) a comparison of the meanings listed for the English words by an English dictionary and the meanings listed for Spanish words in a similar Spanish dictionary; (4) a correlation of the difficulty indexes of the English and Spanish words based upon an administration of the tests. All four approaches produced evidence of substantial but not complete parallelism. The study of meanings revealed that the English and Spanish words have many meanings besides those which they have in common (52:292):

> ...of the total number of meanings (2233) listed for the words of the tests, 1800 (80.8%) were given by the English dictionary for the English words and nearly the same number, 1766 (79.1%), by the Spanish dictionary for the Spanish equivalents of the English words. The closeness of these figures gave considerable confidence in the similarity of the dictionaries chosen for the definitions. The meanings that were judged equivalent in English and Spanish are 59.7% of the total listed from both dictionaries. This means that about 40% of the definitions represent meanings of English words which are not listed for the corresponding Spanish words or meanings of Spanish words which are not listed for the corresponding English words.

The coefficients of Correlation of the difficulty of the English words with the difficulty of the corresponding Spanish words were all above .60—seven of 16 were above .85. Coefficients of correlation for the incorrect responses were generally lower. The correlations of relative difficulty appeared to support the concept of parallelism (p.295):

> In general, then, there is a strong tendency for the relative difficulty of the English words in comparison with other English words of the test to agree with the relative difficulty of the corresponding Spanish words in comparison with other Spanish words of the test. In general, paired words that are relatively difficult in English are relatively difficult in Spanish and those that are relatively easy in English are relatively easy in Spanish. Although the size of the coefficients is not great enough to preclude the possibility of radical disagreement in at least a few individual pairs of words, the evidence on the whole is favorable to the underlying concept of parallelism on which the tests were constructed.

The use of parallel tests in English and Spanish for measuring the achievement of students of Spanish as a second language was studied by Gertrude Jarvis (29 and 37). Form AE (English) and Form BS (Spanish) of the Cooperative Inter-American Tests of Reading, Advanced Level, were administered to second-year Spanish students at the University of Texas. Correlations of the total scores on the English and Spanish tests (.59 on each of two groups) were interpreted as supporting the hypothesis "that a student tends to learn a foreign language in proportion to his mastery of his own language."

A number of doctoral dissertations and master's theses at the University of Texas have produced interpretative and evaluative data relating to the Inter-American Tests or have shown the possibility of their use in attacking other problems. Among these studies are Laurie T. Callicutt, The Construction and Evaluation of Parallel Tests of Reading in English and Spanish (9,1942); Josephine McCranie, A Study of Four Inter-American Tests Applied to High School Seniors (38,1944); Frances Kelley, A Study of the Inter-American Tests at the High School Level (32,1945); Franklin L. Stovall, A Study of Scaled Scores with Special Reference to the Inter-American Tests (54,1945); Ralph C. Willhauk, A Study of Inter-American Tests in Relation to the Stanford Binet (60,1946); Michael Angelo Zaccaria, An Item Analysis of the Advanced Inter-American Tests of General Ability (63,1946); Charles V. Dunham, A Study of the Inter-American Test of General Ability with Special Reference to Children Aged Seven and Eight (18,1947); Mary Anderson, A Comparative Study of the English-speaking and Spanish-speaking Beginners in the Public Schools (3,1951); Vivian Chenault, A Study of the Cooperative Inter-American Tests of General Ability and Reading at the Primary Level (11,1951); Coleman L. Raley, A Study of Two Inter-American Tests at the Upper Elementary and Junior High School Levels (44,1951); Mary Debault, A Study of the English Edition of the Advanced Inter-American Tests of General Ability (16,1952); Paul E. Nichols, A Study of the Cooperative Inter-American Tests of Language Usage at the Junior High School Level (40,1952); George H. Rea, A Study of Four Cooperative Inter-American Tests (47,1954).

Although many questions remain unanswered, the results of research lend hope that further experimentation with the Inter-American concept of parallel tests in English and Spanish may yield fruitful results. The production of a revised series of tests is a first step, and to this the discussion will now turn.

IV

PROCEDURE

This study was initiated with the tentative goal of constructing (1) Tests of General Ability at five levels, beginning with a "readiness" test for kindergarten and first-grade children and extending to a test sufficiently difficult for students in the senior high school and first year of college; (2) Tests of Reading at four levels, beginning with the primary grades and extending to the senior high school and first year of college. One of the first tasks was to transform this general objective into detailed specifications, which of course were elaborated or revised as the work progressed.

Specifications for Tests

Basic to the whole project in constructing both the old series of Inter-American Tests and the new has been the use of a joint English-speaking and Spanish-speaking staff to construct new tests rather than translating existing tests. Even in the tests of reading comprehension it was specified that no materials published by others would be used. Every item included in the tests had to be acceptable for both cultures and both languages. This did not mean that English-speaking and Spanish-speaking children in general were expected to perform equally well on an item or a group of items. The items used and the activities required in the tests were to be common to the cultures in which they were used but not necessarily equally common. Indeed, it was expected that the tests might well reveal cultural differences.

Basic also has been the requirement that the English and Spanish editions must have identical content except for the language used—that is, as nearly identical as a staff is able to make it. The language used in one would be a translation of that used in the other. Proposed items which for linguistic or other reasons were not suitable for both English and Spanish editions would be rejected.

The Cooperative Inter-American Tests of General Ability and Tests of Reading provided the general pattern for the new tests, but important changes were planned. Five levels of Tests of General Ability were to replace the three of the old series. This would be accomplished by constructing two at the primary level, the first of which would be a "readiness" test for beginners, and by developing three instead of two levels of tests above the primary. There would be four levels of Tests of Reading--the primary, and three above the primary level. The materials of the tests and the difficulty of the items were planned primarily for the grades indicated below:

Level 1 -- end of kindergarten and beginning of grade 1
Level 2 -- grades 2 and 3
Level 3 -- grades 4, 5, and 6
Level 4 -- grades 7, 8, and 9
Level 5 -- grades 10, 11, 12, and college 1

The Cooperative Inter-American Tests of General Ability at the primary level had three parts—Oral Vocabulary, Classification, and Association—and the scores on these were combined into a total score. The intermediate and advanced tests had four parts—Classification, Figure Analogies, Number Series, and Word Relations. Scores on the first three of these were combined to produce a nonverbal score, and the score on the fourth was used as a verbal score.

Plans for the new Tests of General Ability at level 1 included a subscore indicating readiness for reading and another subscore indicating readiness for arithmetic. Above this first level it was thought desirable to have three subscores corresponding to the usual terminology Verbal, Nonverbal, and Numerical or Quantitative. Plans for the tests at levels 1 and 2 were later modified to include only two subscores—Verbal-Numerical (from a combination of Oral Vocabulary and Number) and Nonverbal (from a combination of Association and Classification at level 1 and a combination of Classification and Analogies at level 2). Two types of material were chosen for each subscore above level 2: a Sentence Completion test was added to Word Relations of the Cooperative Inter-American Tests for the Verbal score, Classification and Figure Analogies were separated from Number Series for the Nonverbal score, and Computation was added to Number Series for the Numerical score.

The Tests of Reading in the Cooperative Inter-American Tests were planned to yield two subscores--Vocabulary and Comprehension. The design for the new edition included the same kinds of tests in the same general form but included also a separate part for measuring Speed of Comprehension as contrasted with Level of Comprehension (the new name for the old Comprehension subtest).

Conforming to the CIA pattern, each test of the new series was to have two forms in English and in Spanish, the letters C and D replacing the A and B of the old.

Further details of the specifications will be clear as illustrations and discussions of the tests actually produced are presented in a later section.

Use of Old Materials and Creation of New

Although only Tests of General Ability and Reading were planned for the new edition, all of the Cooperative Inter-American Tests were made available by Guidance Testing Associates for such materials as could be used. The Active Vocabulary of the Test of Language Usage and the Tests of Vocabulary and Interpretation of Reading Materials in the Natural Sciences and the Social Sciences seemed to be possible sources of material for the Tests of Reading.

The first step in utilizing the CIA test materials was to administer the tests for item analysis to find the discriminating power and the difficulty of each item. Although the items had originally been carefully selected by standard procedures, they were to be combined with newly constructed items and redistributed over the levels planned for the new tests.

Following the administration of the tests an item analysis was made, and items (in original or revised form) were chosen for tryout with newly constructed items. Many of the old items were changed to conform to the style adopted for the sections in which they were to be placed. For example, a fifth alternative was added to the original four of the items from the Vocabulary of the intermediate and advanced Tests of Reading, and words were substituted for letters in items from the Active Vocabulary of the Tests of Language Usage.

The construction of new items for tryout was approached as a major problem. Obviously, the quality of an item is the factor which most of all makes the difference between a good test and a poor test. No amount of statistical work, however refined, can make a good item out of a poor one.

In the construction of new items for the Computation subtest, by special arrangement the regular staff had two outside sources of materials from which to draw—experimental arithmetic tests formulated in research for the master's degree by Bessie Mitchell (39) and by Robert G. Petersen (42).

Item Analysis

In item analysis two indices were found—one to estimate item-difficulty and the other item-discrimination. The measure of item-difficulty is the percentage of right responses. For example, if 90 per cent of a group taking a test answers an item correctly, the item is obviously an easy one for that group. The measure of item-discrimination is the correlation of an item with the test as a whole. If in general those who get the higher scores on a test answer an item correctly and those who get the lower scores answer it incorrectly, the item is said to have good discriminating power. This relationship is expressed by a coefficient of correlation.

Chung-Teh Fan's Item Analysis Table (21) was generally used for estimating both item-difficulty and item-discrimination. To enter this table we found the proportions of success in approximately the highest 27 per cent and approximately the lowest 27 per cent of the distribution of scores. In some computations for a small number of cases we estimated a tetrachoric correlation, dichotomizing the distribution at the median and using the chart developed at the North Carolina State Personnel Department (61).

In evaluating an item the difficulty index and the discrimination index of the item for both English-speaking and Spanish-speaking populations were examined. For purposes of placing items according to difficulty, the mean of the English index and the Spanish index was used. We made some computations from transformation of percentages to standard units, but concluded that the saving in accuracy was not worth the extra time and effort required. The mean of the English and Spanish difficulty indices does not give a true order of difficulty for items in either language, but the results of such displacement are probably not serious.

Preference was given to items with good discriminating power in both English and Spanish. As a rough criterion an index of at least .20 was regarded as necessary unless there were special reasons for including an item with a lower index—for example, a very easy or a very difficult item.

An attempt was made to keep a balance in Forms C and D both in the content and the difficulty of the items chosen. A kind of running balance was kept from item to item to see that the difficulty of the items assigned to one form was about the same as the difficulty of the items assigned to the other.

Administration of Tests

Items selected for the final tests were brought together and printed in test booklets, answer sheets for levels 3, 4, and 5 were prepared, time limits were determined, and directions were formulated. Then the tests were administered for interpretative and evaluative data. Specifically, we sought information on the difficulty of the tests in relation to the grades for which they were designed, intercorrelations of test scores, reliability coefficients, equivalent scores for forms C and D, equivalent scores for tests at different levels, to a limited extent evidence on validity, and at least tentative norms.

The English edition of the tests was administered in schools in several different states, but predominantly in Texas, which itself is quite varied in community characteristics. The Spanish edition was administered primarily in Puerto Rico in the public schools, a few private schools, and the University of Puerto Rico. Special testing programs were conducted in Chile, Costa Rica, Panamá, México, and Venezuela. Reference will be made to special programs with the English edition later in the report.

Because of the large number of tests to be administered, the widespread localities in which they were given, and the severe limitations of personnel and resources, the central staff could exert little control over the testing beyond the provision of directions and testing design. It is believed, however, that on the whole the tests were carefully administered. Some cases of obvious departure from the testing design occurred—for example, failing to alternate the order of administration of Forms C and D to balance practice effect. Contrasted with such failures were the efforts of recognized test specialists to assist in getting valid results.

The sampling required for an independent derivation of "national norms" for the United States and for a determination of stable norms for Spanish-speaking regions was beyond the resources of the project. However, we have set up tentative norms for the English edition (except General Ability at levels 1 and 2) by calibrating the tests with well-known existing tests. For some of the children who took our Tests of Reading, Level 2, we were able to get scores on the Metropolitan or Stanford Reading Tests which the school systems gave in their own programs. Our program of testing included a limited administration of the School and College Ability Tests (SCAT) and the Reading Tests of the Sequential Tests of Educational Progress (STEP) of the Educational Testing Service to find "equivalent" scores for the Tests of General Ability and Tests of Reading. In addition, the American Institute for Research conducted a special testing program for calibrating our Tests of General Ability and Tests of Reading, Level 5, with related Project Talent Tests, preparing correlation matrices, conversion tables, and national norms for grades 9 to 12.

Statistical Analysis

In the statistical analysis a high-speed electronic computer was used for most of the computations. Individual data were punched on cards, and the machines printed, as called for, product moment correlations, distributions by unit intervals, and corresponding percentiles at the midpoints of the intervals.

As stated in the section on related research we have used the correlation of Forms C and D administered to the same groups to find an estimate of reliability. This correlation is influenced not only by the internal consistency of a single form but also by differences in the forms, and by variations in the testing situation and in the persons tested. Our testing designs usually suggested about a week between administrations of the two forms, but dates on the first and second test booklets show that the intervals sometimes varied from this design.

Equivalent Scores

As the term is used here, scores of similar tests are assumed to be equivalent when they are equally difficult to attain by persons who take the tests. For example, if it is as hard to reach a score of 65 on Test X as it is to reach a score of 67 on Test Y, we infer that the scores 65 and 67 are equivalent.

In this study the problem of finding equivalent scores arises at four points. First, what score on a test in one language is equivalent to a given score on the corresponding test in the other language? Is a score of 40 on one of the Spanish reading tests just as hard to attain as is a score of 40 on the parallel English test? Does 40 represent the same ability in reading Spanish as it represents in reading English?

Second, what scores on the two forms (CE and DE or CEs and DEs) of a test are equivalent? Are the forms equally difficult?

Third, how do the scores on a test at one level compare with the scores on a test in the same series at the level immediately below or immediately above the first test? For example, the most difficult items on the Level 3 Reading Test are more difficult than the easiest items on the Level 4 Reading Test; what are the corresponding scores at the points of overlapping difficulty? If we can answer this question, we can use the equivalent scores of different levels to make a continuous scale into which the scores at each level may be converted.

Fourth, what score on a test in our series is just as hard to reach as a given score in a similar test of a published series? For example, what score on our Test of General Ability, Level 3, is equivalent to a score of 260 on the School and College Ability Test of the Educational Testing Service?

Evidence on the equivalence of scores comes from three main sources. The first is the method of construction. As explained earlier, we have chosen items with careful attention to balancing the difficulty of the items assigned to Forms C and D. A second method of equating scores is that of giving the tests with which one is concerned to the very same persons or to groups which are assumed to be equivalent because of the way the groups are chosen, or which are judged to be equivalent on the basis of some other criterion. Another possibility is the comparison of scores on two different tests by equating each in turn with a third test. Thus if Test X and Test Y scores have been equated with Test Z scores, we assume that the X score which lies at the 60th percentile on Test Z is equivalent to the Y score which lies at the same percentile on Test Z.

The results obtained by the equi-percentile method of equating scores are influenced by the extraneous factors which tend to raise or lower all test scores. The number of items answered correctly in multiple-choice tests may reflect not only the ability of the person tested but also his motivation, his acquaintance with the testing procedure, his effort, his recent experience with similar content, the conditions under which the testing is done, and other variables in the testing situation.

It is common experience in administering two forms of a test or two similar tests to the same group with a relatively short interval between the test administrations to find the scores on the second test somewhat different from those on the first test. The shift in relative rank of individual scores is measured by the coefficient of coefficient and is treated under reliability. In equating the scores the test constructor is interested also in the differences between the scores obtained in the two administrations. The difference he is seeking is that which results from the difference in difficulty. Thus the difference in score caused by a difference in the difficulty of Forms C and D or of Levels 3 and 4 may be represented by d. But the actual differences obtained in administering the tests are contaminated by other factors which tend to raise or lower the score of either the first test or the second test in relation to the other. Although it is an oversimplification, we may represent this disturbing group of factors as p and refer to the complex as practice effect.

If Forms C and D are administered to a group in the order C to D, the equation of the scores is this (d represents the amount the D score exceeds the C score because of difficulty alone):

$$D - C = p + d$$

If the tests are administered in the reverse order,

$$C - D = p - d$$

Assuming that the p and d of the first equation are identical with the p and d of the second equation, the two equations may be easily solved for values p and d.

Suppose, for example, we have given Form C and D in the order C to D to one group, and in the order D to C to another with these results:

$$C = 40,\ D = 46;\ C = 40,\ D = 38$$

Then

$$\begin{aligned} p + d &= 46 - 40 = 6 \\ p - d &= 40 - 38 = 2 \\ 2p &= 8, \text{ and } p = 4 \\ 2d &= 4, \text{ and } d = 2 \end{aligned}$$

These results mean that the obtained difference in the scores on the two forms results from a difference in difficulty of 2 points (D is easier than C) and a "practice effect" of 4 points. The same reasoning holds for equating different tests and tests of the same series at different levels.

The situation is much more difficult than appears in the above analysis. Even d may vary with different groups. For example, if a test using answer sheets is being compared with one which does not, the difference in difficulty may be greater for a group inexperienced with answer sheets than for one more experienced. In many situations p is a much more disturbing variable. Factors particularly hard to control—and largely unknown when tests are administered in many places by different examiners without supervision by the project staff—are the testing conditions and the motivation of the persons tested. On the second test the group may be stimulated to do a better job than on the first, or it may be tired of the whole procedure.

In the 62nd Yearbook of the National Society for the Study of Education (62:49-52) Wrightstone stresses the importance of motivation as a factor in test performance, calling attention to possible differences in the attitudes of different groups. Of special interest in this study is his reference to "lower-class children":

> Observation of the performance of lower-class children on speeded tests leads one to suspect that such children often work very rapidly through a test, making responses more or less at random. Apparently they are convinced in advance that they cannot do well on the test, and they find that by getting through the test rapidly they can shorten the period of discomfort which it produces.

To get a first approximation of equivalent scores from the administration of tests to two groups in different order, we have taken the score of one test as a basis and have found the mean of the two scores of the other lying at corresponding percentiles—one score from the test administered before and one from the test administered after the base test. The percentile values are taken directly from the distribution tables or from percentile graphs smoothed to iron out irregularities and to show probable trends. Suppose, for example, that a score of 40 on Form C administered in the order C to D is at the 58th percentile and that the score on Form D at the 58th percentile of the same group is 46. Suppose further that the score of 40 on Form C administered in the order D to C is at the 52nd percentile and that the score on Form D at the 52nd percentile is 38. Then the mean of 46 and 38 (42) is our approximation of the D score equivalent of a C score of 40. Adding the two scores partials out the factor p if it may be assumed that p and d in the first administration are equal to p and d in the second.

In the method of equating scores by administering tests to groups thought to be of equal ability, disturbing variables may occur from differences in the test situation or from differences in the group. It is impossible by any method to match groups perfectly, and in groups of limited size unexpected differences may occur. In this research we have tried to approximate groups of equal ability by taking alternate names on a roster or by distributing booklets alternately within a group so that as the persons are seated each has a booklet different from that of the one sitting next to him. The reason for using this method is of course its simplicity and the difficulty of using more rigorous methods under the conditions within which our study has been carried forward. In some cases we are sure that the method did not result in groups of approximately equal ability, but in other cases the results seemed satisfactory. For example, in groups of 1514 and 1505 entering freshmen to whom different forms of the Test of General Ability were distributed alternately at the University of Texas the mean Verbal scores of the Scholastic Aptitude Test presented for admission were 496 and 499 with sigmas of 95 and 92.

Equivalence of English and Spanish Tests

The equi-percentile method of equating test scores cannot be used to equate the scores of the English edition with the scores of the Spanish edition. There is no way of finding persons who have the same ability in both languages. The answer to the question whether scores on the English edition are equivalent to the corresponding scores on the Spanish edition must rest in large measure on the content of the tests and the methods used in their construction. Results from the use of the tests with different populations and further analyses of the materials may strengthen or weaken our confidence in the equivalence of the scores.

V

RESULTS

The major outcome of this research is a new series of Inter-American Tests with interpretative and evaluative data. The test materials include test booklets, directions for administration, answer sheets, and scoring keys. The series includes Tests of General (scholastic) Ability and Tests of Reading in parallel English and Spanish editions. The corresponding English and Spanish tests have the same content except for the language used. The materials for General Ability are designed for use at five levels, and the Tests of Reading at four levels. Two forms, C and D, have been constructed for each level. The E (English) or the Es (Español) following the C or D indicates the language of the test, and in the short title the number indicates the level. Thus, GA-1-CE means the English edition of the Test of General Ability, Level 1, Form C; in turn, HG-1-CEs means the parallel Spanish edition, Habilidad General, Nivel 1, Forma C.

The Tests

The following outline lists the tests in the series and the grades (in terms of the school systems of the United States) for which each test is primarily designed.

General Ability

Level 1, end of kindergarten and beginning of grade 1:

(a) Pretest and Pre-Prueba
(b) GA-1-CE, GA-1-DE; HG-1-CEs, HG-1-DEs
(c) GA-1-CE-A, GA-1-DE-A; HG-1-CEs-A, HG-1-DEs-A
(Abbreviated form of Level 1 Tests. Directions were prepared for the Spanish edition, but only the English booklets were printed.)

Level 2, grades 2 and 3: GA-2-CE, GA-2-DE; HG-2-CEs, HG-2-DEs

Level 3, grades 4, 5, and 6: GA-3-CE, GA-3-DE; HG-3-CEs, HG-3-DEs

Level 4, grades 7, 8, and 9: GA-4-CE, GA-4-DE; HG-4-CEs, HG-4-DEs

Level 5, grades 10, 11, 12, and beginning college: GA-5-CE, GA-5-DE; HG-5-CEs, HG-5-DEs

Reading

Level 2, grades 2 and 3: R-2-CE, R-2-DE; L-2-CEs, L-2-DEs

Level 3, grades 4, 5, and 6: R-3-CE, R-3-DE; L-3-CEs, L-3-DEs

Level 4, grades 7, 8, and 9: R-4-CE, R-4-DE; L-4-CEs, L-4-DEs

Level 5: grades 10, 11, 12, and beginning college: R-5-CE, R-5-DE; L-5-CEs, L-5-DEs

A bound volume of the materials has been delivered to the Office of Education.

Timing and Length of Tests

The test constructor is caught in a puzzling dilemma when he faces the problem of getting all that he wants in a test within the time which can reasonably be devoted to it. Increasing the length of a test makes it more reliable, but the additional time required often makes it less desirable in the practical situation. The inclusion of different types of material to increase validity or to produce multiple scores adds to the pressure for a greater number of items and a longer testing period. Speed is also a crucial factor, and it is disturbing to find that the time appropriate to one group may not be equally appropriate to another. Our tests clearly reflect a compromise of these conflicting demands.

With some exceptions (Speed of Reading, for example) we started out with generous time limits to emphasize power rather than speed. Partly on the basis of our early experience the time limits of many of the tests were cut, as will be shown in the outlines to follow. In one case, Speed of Reading at Levels 3, 4, and 5, the time was increased. The older time limits are given in parentheses.

General Ability, Level 1, Pretest and Pre-Prueba

Testers have long known that the change in score upon application of a test a second time in a different form varies from individual to individual and from group to group. A part of this difference in individual scores and in group scores has been attributed to differences in skill in test-taking, and it has been assumed that acquaintance with and practice in test-taking should minimize that variable and therefore produce results more nearly representative of the trait being measured.

Observing the differences in gain from test to retest, we formed the hypothesis that a pretest containing material like the material of the test itself but shorter and administered as a teaching device would give an essential part of the experience needed in acquiring test skills, and that as a result the scores of the first and second tests would be less different. The need seemed to be especially acute with children just entering the first grade. Consequently, we put our hypothesis to test at that point, formulating parallel Pretest and Pre-Prueba for use preceding the administration of the level 1 tests.

Four-page booklets, 6 x 9 1/2 inches, were prepared with directions to the examiner printed on the booklet as a matter of economy and also of convenience to the examiner. These booklets are reproduced in full (1) to illustrate the meaning of parallel English and Spanish editions, (2) to present the reasoning back of the Pretest experiment, and (3) to show in detail the content and method of the Pretest. (See Figures 1-4.)

In Oral Vocabulary the picture in the frame at the left on which the child is asked to put his finger is obviously an index in lieu of numbers to help the child find and keep the place at which he is to work. The method of marking the correct answer is the most simple which we could devise—simply marking across the drawing chosen as the answer.

General Ability, Level 1. GA-1-CE, GA-1-DE; HG-1-CEs, HG-1-DEs.

Parts and Subtests	Number of Items		Time Exclusive of Directions	
1. Oral Vocabulary	25		(Each item dictated)	
2. Number	15		(Each item dictated)	
Verbal-Numerical (1+2)		40		
3. Association	20		8 minutes	(old 10)
4. Classification	20		8 minutes	(old 10)
Nonverbal (3+4)		40		16 minutes
Total Score		80		

The Pretest has given a preview of the material and method of testing general scholastic ability (or better, "readiness") at level 1. The material used at this level is

Page 1

ORAL VOCABULARY

EXAMINER: Read these directions and help the children to do what is asked. When all are ready, say:

"Look at this row of pictures." (Point to the pictures on the blackboard.) "Look at the house. Now look at the tree." (Point to the house and the tree on the blackboard.) "See, I mark the tree like this." (Draw a long diagonal line through the tree.)

"Now look at your paper. Find the house. Put your finger on the house." (Pause.) "In the same row find the tree. Mark the tree as I did on the blackboard." (Demonstrate again. See that all comply.)

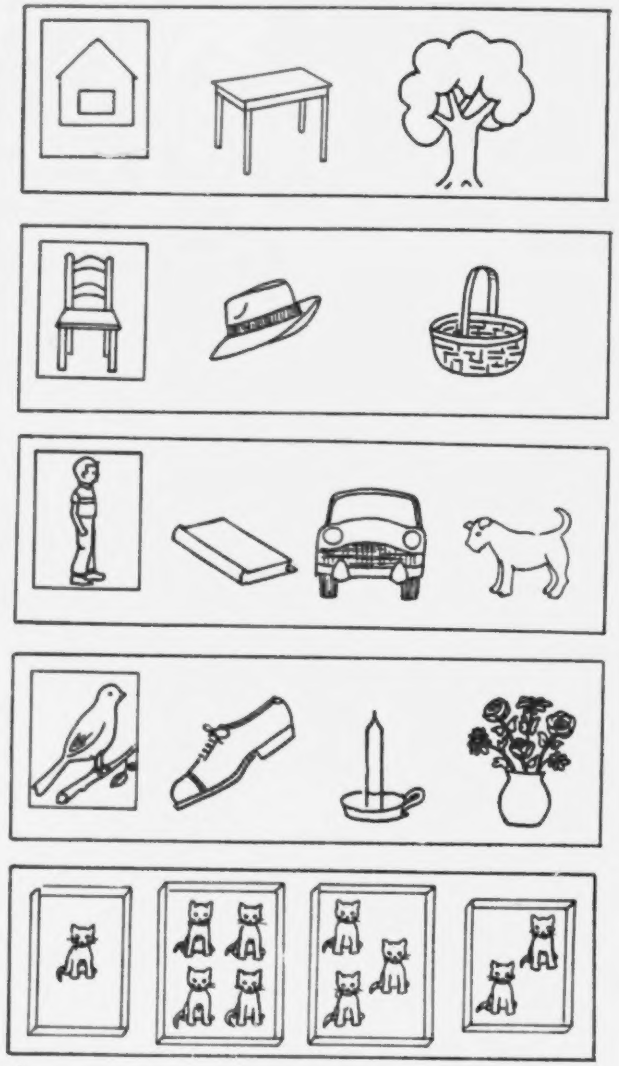
"Now find the chair. Put your finger on the chair." (Pause.) "In the same row find the hat. Mark the hat." (See that all comply.)

"Now find the boy. Put your finger on the boy." (Pause.) "In the same row find the dog. Mark the dog." (See that all comply.)

"Now find the bird. Put your finger on the bird."(Pause.) "In the same row find the shoe. Mark the shoe." (See that all comply.)

"Now find the cats in the boxes. Find the box that has only two cats. Mark the box that has only two cats." (See that all comply.)

"Now turn the page and fold it back like this." (Demonstrate. See that all have page 2.)



Página 1

VOCABULARIO ORAL

EXAMINADOR: Lea estas instrucciones y ayude a los niños a hacer lo que se les pide. Cuando todos estén listos, diga:

"Miren esta fila de dibujos." (Señale hacia los dibujos en el pizarrón.) "Miren la casa. Ahora miren el árbol." (Señale hacia la casa y el árbol en el pizarrón.) "Vean, yo marco el árbol así." (Dibuje una línea diagonal larga a travél del árbol.)

"Ahora miren su papel. Busquen la casa. Pongan el dedo en la casa." (Pausa.) "En la misma fila busquen el árbol. Marquen el árbol como yo hice en el pizarrón." (Demuestre otra vez. Fíjese que todos lo hagan.)

"Ahora busquen la silla. Pongan el dedo en la silla." (Pausa.) "En la misma fila busquen el sombrero. Marquen el sombrero." (Fíjese que todos lo hagan.)

"Ahora busquen el niño. Pongan el dedo en el niño." (Pausa.) "En la misma fila busquen el perro. Marquen el perro." (Fíjese que todos lo hagan.)

"Ahora busquen el pájaro. Pongan el dedo en el pájaro." (Pausa.) "En la misma fila busquen el zapato. Marquen el zapato."(Fíjese que todos lo hagan.)

"Ahora busquen los gatos en las cajas. Busquen la caja que tiene solamente dos gatos. Marquen la caja que tiene solamente dos gatos."(Fíjese que todos lo hagan.)

"Ahora den vuelta a la página y dóblenla hacia atrás, así." (Demuestre. Fíjese que todos tengan la página 2.

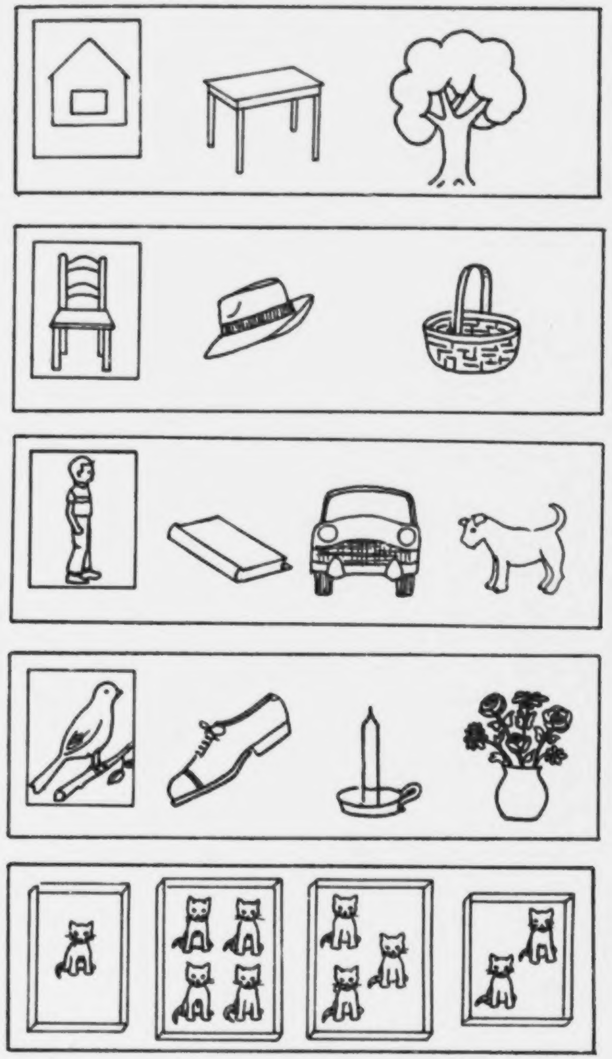


Figure 1. Pretest, Page 1.

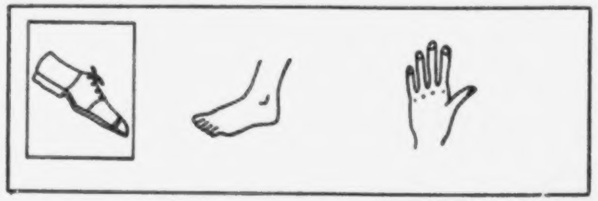
Page 2

ASSOCIATION

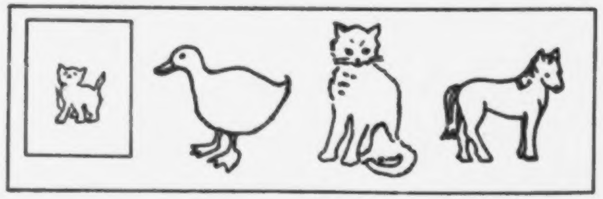
EXAMINER: On the first page you gave directions for each question. On pages 2 and 3 you will give directions only at the beginning. Some of the children may need help to adjust to this change. When all are ready, say:

"Now we are going to find the pictures that go together." (Point to the pictures on the blackboard.) "Look at the shoe, the hand, and the foot." (Point.) "Does the shoe go with the hand? No, we do not wear shoes on our hands. The shoe belongs to the foot. So we mark the foot to show that the shoe belongs to the foot." (Demonstrate.)

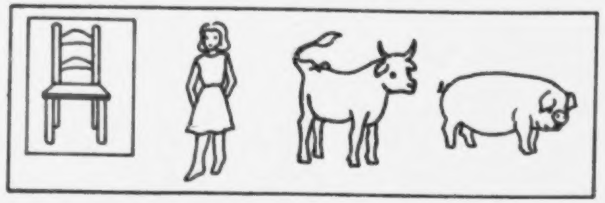
"Now look at your paper. Find the shoe." (Pause.) "In the same row mark the foot to show that the shoe belongs to the foot." (See that all comply.)

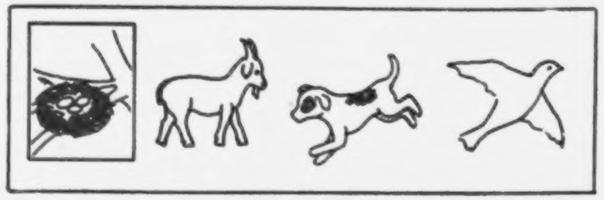


"Now look at the first picture in the next row, the kitten, and mark the picture that goes with it." (Pause.) "Does the kitten belong to the duck or the horse? No, the kitten belongs to the cat. So mark the cat to show that the cat goes with the kitten." (See that all comply.)

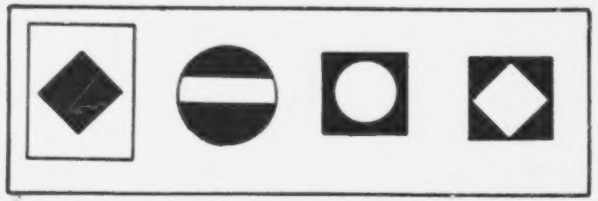


"Now do the others by yourself. In each row look at the first picture, and find the one that goes with it." (Give individual help as necessary, but encourage each child to work independently.)





When all are ready, say: "Now turn the paper over like this." (Demonstrate. See that all have page 3.)



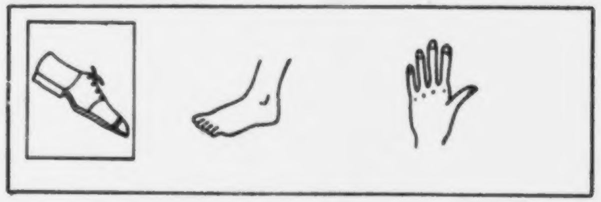
Página 2

ASOCIACIÓN

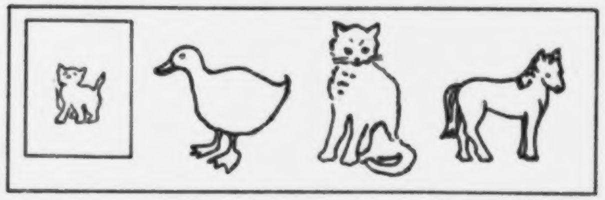
EXAMINADOR: En la primera página usted dió instrucciones para cada pregunta. En las páginas 2 y 3 dará instrucciones solamente al principio. Algunos niños necesitarán ayuda para ajustarse a este cambio. Cuando todos estén listos, diga:

"Ahora vamos a buscar los dibujos que van juntos." (Señale hacia los dibujos en el pizarrón.) "Miren el zapato, la mano, y el pie." (Señale.) "¿Va el zapato con la mano? No, no usamos zapatos en las manos. El zapato pertenece al pie. Por lo tanto marcamos el pie para indicar que el zapato pertenece al pie." (Demuestre.)

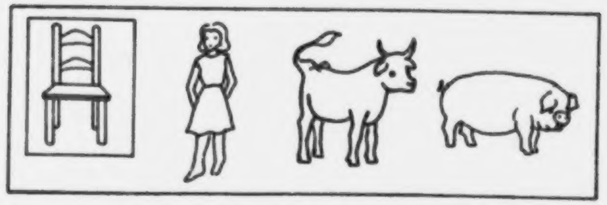
"Ahora miren su papel. Busquen el zapato." (Pausa.) "En la misma fila marquen el pie para indicar que el zapato pertenece al pie." (Fíjese que todos lo hagan.)

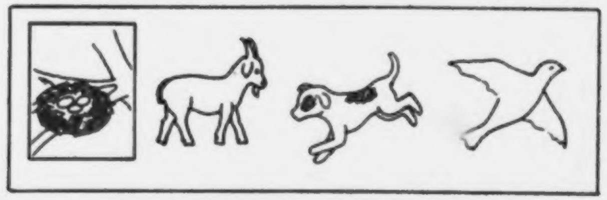


"Ahora miren el primer dibujo en la próxima fila, el gatito, y marquen el dibujo que va con él." (Pausa.) "¿Pertenece el gatito al pato o al caballo? No, el gatito pertenece al gato. Por lo tanto marquen el gato para indicar que el gato va con el gatito." (Fíjese que todos lo hagan.)



"Ahora hagan los demás ustedes solos. En cada fila miren el primer dibujo y busquen el que va con él." (Preste ayuda individual cuando sea necesaria, pero anime a cada niño a que trabaje independientemente.)





Cuando todos estén listos, diga:

"Ahora den vuelta al papel, así." (Demuestre. Fíjese que todos tengan la página 3.)

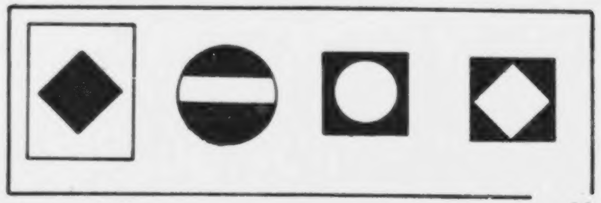
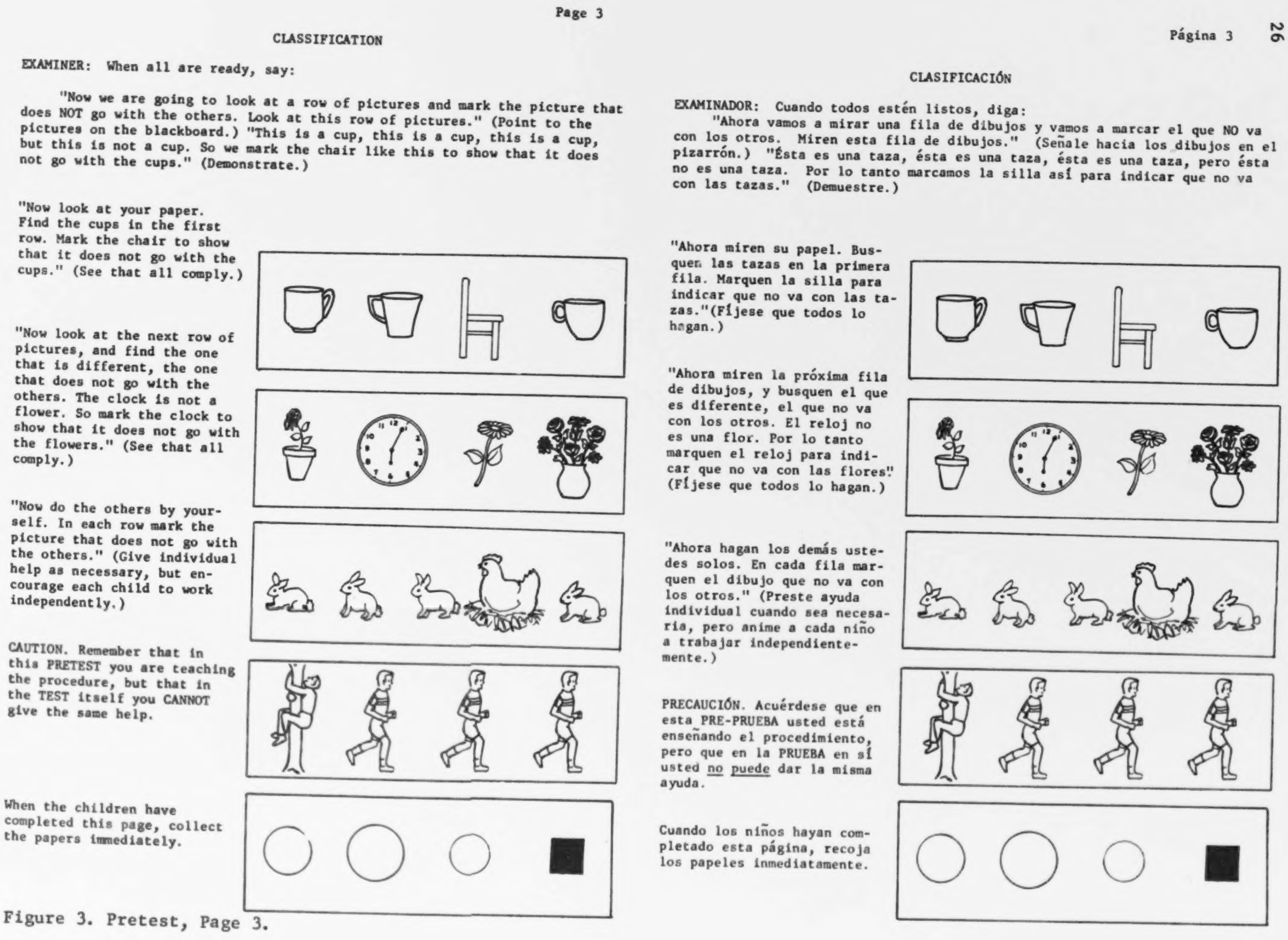


Figure 2. Pretest, Page 2.



Page 3

CLASSIFICATION

EXAMINER: When all are ready, say:

"Now we are going to look at a row of pictures and mark the picture that does NOT go with the others. Look at this row of pictures." (Point to the pictures on the blackboard.) "This is a cup, this is a cup, this is a cup, but this is not a cup. So we mark the chair like this to show that it does not go with the cups." (Demonstrate.)

"Now look at your paper. Find the cups in the first row. Mark the chair to show that it does not go with the cups." (See that all comply.)

"Now look at the next row of pictures, and find the one that is different, the one that does not go with the others. The clock is not a flower. So mark the clock to show that it does not go with the flowers." (See that all comply.)

"Now do the others by yourself. In each row mark the picture that does not go with the others." (Give individual help as necessary, but encourage each child to work independently.)

CAUTION. Remember that in this PRETEST you are teaching the procedure, but that in the TEST itself you CANNOT give the same help.

When the children have completed this page, collect the papers immediately.

Página 3

CLASIFICACIÓN

EXAMINADOR: Cuando todos estén listos, diga:

"Ahora vamos a mirar una fila de dibujos y vamos a marcar el que NO va con los otros. Miren esta fila de dibujos." (Señale hacia los dibujos en el pizarrón.) "Ésta es una taza, ésta es una taza, ésta es una taza, pero ésta no es una taza. Por lo tanto marcamos la silla así para indicar que no va con las tazas." (Demuestre.)

"Ahora miren su papel. Busquen las tazas en la primera fila. Marquen la silla para indicar que no va con las tazas."(Fíjese que todos lo hagan.)

"Ahora miren la próxima fila de dibujos, y busquen el que es diferente, el que no va con los otros. El reloj no es una flor. Por lo tanto marquen el reloj para indicar que no va con las flores." (Fíjese que todos lo hagan.)

"Ahora hagan los demás ustedes solos. En cada fila marquen el dibujo que no va con los otros." (Preste ayuda individual cuando sea necesaria, pero anime a cada niño a trabajar independientemente.)

PRECAUCIÓN. Acuérdese que en esta PRE-PRUEBA usted está enseñando el procedimiento, pero que en la PRUEBA en sí usted no puede dar la misma ayuda.

Cuando los niños hayan completado esta página, recoja los papeles inmediatamente.

Figure 3. Pretest, Page 3.

Page 4

PRETEST FOR BEGINNING FIRST-GRADE CHILDREN
(Inter-American Series)

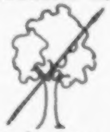
To the Examiner

The purpose of this PRETEST is to prepare children for administration of the Test of General Ability, Level 1. Preferably, it should be given one day before the test itself.

Children have to learn how to take a group test just as they have to learn other school activities. In the PRETEST you can be both teacher and examiner. In the test itself you must be examiner only.

The children should learn:

(1) to do what is asked when directions are given to a group;
(2) to mark the correct picture with a firm diagonal line like this --



(3) to mark only one picture in each row;
(4) to answer each question in order;
(5) to turn the page and fold it back as requested;
(6) to find the place which the examiner indicates;
(7) to work alone without any help except the directions which the examiner gives;
(8) to respond correctly to the phrases "belongs to" and "does not go with."

The examiner should work with groups of 8 to 12 children. Each child should have a copy of this leaflet and a pencil or crayon, and should be seated where he can not easily copy from others.

Before distributing the PRETEST materials copy on the blackboard the first row of pictures in each of the three parts. The directions, which are to be read by the examiner only, are printed near the drawings with which they will be used.

Cautions: Use only this PRETEST to prepare for the TEST itself. Do not make up exercises of your own.

Do not try to prepare for the specific questions of the TEST which is to be given later. Remember that some questions are meant to be too difficult for most beginning children.

Do not let the children have the PRETEST papers to color or to play with.

Figure 4. Pretest, Page 4.

Página 4

PRE-PRUEBA PARA NIÑOS EMPEZANDO EL PRIMER GRADO
(Serie Interamericana)

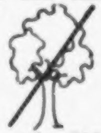
Al examinador

El propósito de esta PRE-PRUEBA es preparar a los niños para la administración de la Prueba de Habilidad General, Nivel 1. Es preferible que se administre un día antes de la prueba en sí.

Los niños tienen que aprender a tomar una prueba en un grupo al igual que tienen que aprender otras actividades escolares. En la PRE-PRUEBA usted puede ser tanto maestro como examinador. Durante la prueba en sí debe ser examinador solamente.

Los niños deben aprender:

(1) a hacer lo que se pide cuando se dan instrucciones a un grupo;
(2) a marcar el dibujo correcto con una línea diagonal firme, así --



(3) a marcar solamente un dibujo en cada fila;
(4) a contestar cada pregunta en orden;
(5) a dar vuelta a la página y doblarla hacia atrás como se les pide;
(6) a encontrar el lugar que el examinador indica;
(7) a trabajar solos sin ninguna ayuda excepto las instrucciones que da el examinador;
(8) a reaccionar correctamente a las frases "pertenece a" y "no va con."

El examinador debe trabajar con grupos de 8 a 12 niños. Cada niño debe tener una copia de este folleto y un lápiz o creyón, y debe estar sentado donde no pueda copiarse fácilmente de otros.

Antes de distribuir los materiales de la PRE-PRUEBA copie en el pizarrón la primera fila de dibujos en cada una de las tres partes. Las instrucciones, que solamente el examinador leerá, están impresas cerca de los dibujos con los cuales serán usadas.

Precauciones: Use solamente esta PRE-PRUEBA como preparación para la PRUEBA en sí. No invente ejercicios por su propia cuenta.

No trate de preparar a los niños para las preguntas específicas de la PRUEBA que se dará después. Recuerde que algunas preguntas son a propósito demasiado difíciles para la mayoría de los niños principiantes.

No permita que los niños obtengan los papeles de la PRE-PRUEBA para pintar o para jugar.

further illustrated in Figure 5 by drawings taken from the Practice Exercises which immediately precede each test except Number. One set of practice exercises serves for both Oral Vocabulary and Number. The booklets for these tests have 12 pages, 8 1/2 by 11 inches, printed with the short axis perpendicular to the child and bound on the short side at the left.

In both Part I, Oral Vocabulary, and Part 2, Number, the task of the pupil is indicated orally. The time here is not rigidly specified, but after the Practice Exercises a period of 15 to 25 seconds is suggested for each item. In Oral Vocabulary, the directions of the examiner may simply name an object, may describe a situation in a few words like "the boy who is running," or may ask the child to "find the picture which makes you think of ...." The items in Number include numerical concepts and "problems" of computation. In the latter, the answer is usually indicated by marking a frame which has the number of pictured objects which the question calls for. In two questions the answer is a number inclosed in a circle. These two are the only items of the entire test requiring a knowledge of written language and are designed to increase the "readiness" score of children who already know the written symbols for numbers.

The task in Association is to find the picture that goes with or belongs to the stimulus picture in the frame. In Classification, on the other hand, the child finds the picture that is different, that does not go with the others.

Experimental administration of the first formulated Tests of General Ability, Level 1, revealed that Part I, Oral Vocabulary, was too easy. It appeared also that the use of the same pictures in both forms of Oral Vocabulary (a policy adopted in part for reasons of economy) led to an easy confusion of the directions for the two forms in administering the tests. It appeared also that the time allowed for the Nonverbal tests might well be shortened. The defects in Part 1 seemed sufficient to justify the preparation of a revised edition with new booklets. The new booklets were like the old except for the changes in Oral Vocabulary and a change in the order of the Nonverbal tests, placing Association before Classification. The Oral Vocabulary was made a little more difficult, the index pictures were shifted or changed, and the two forms of the test were differentiated by different drawings in the first two items. The time for each page of Association and Classification was reduced from five to four minutes.

General Ability, Level 1. GA-1-CE-A, GA-1-DE-A; HG-1-CEs-A, HG-1-DEs-A.

Experience with the level 1 Tests of General Ability and the Pretest suggested the construction of abbreviated forms which would have a wider range of difficulty, cover fewer pages, and require less time for administration. These forms are indicated by the symbol A. The items were drawn from the longer tests except that in each form five items were added to Oral Vocabulary from the level 2 tests and one item to Association from materials previously tried out but not yet used. The result was an eight-page booklet with pages 8 1/2 x 11 inches and with the long axis perpendicular to the child who is being tested. The number of items was 24 for Oral Vocabulary, 8 for Number, and 16 each for Association and Classification, a total of 64. Number items requiring a knowledge of written symbols were omitted. The drawings were smaller than those of the original test.

General Ability, Level 2. GA-2-CE, GA-2-DE; HG-2-CEs, HG-2-DEs.

Parts and Subtests	Number of Items		Time Exclusive of Directions	
1. Oral Vocabulary	30		(Each item dictated)	
2. Number Oral	10		(Each item dictated)	
Written	20		5 minutes	(old 5)
Verbal-Numerical (1+2)		60		
3. Classification	24		6 minutes	(old 8)
4. Analogies	16		5 minutes	(old 6)
Nonverbal (3+4)		40	11 minutes	
Total Score		100		

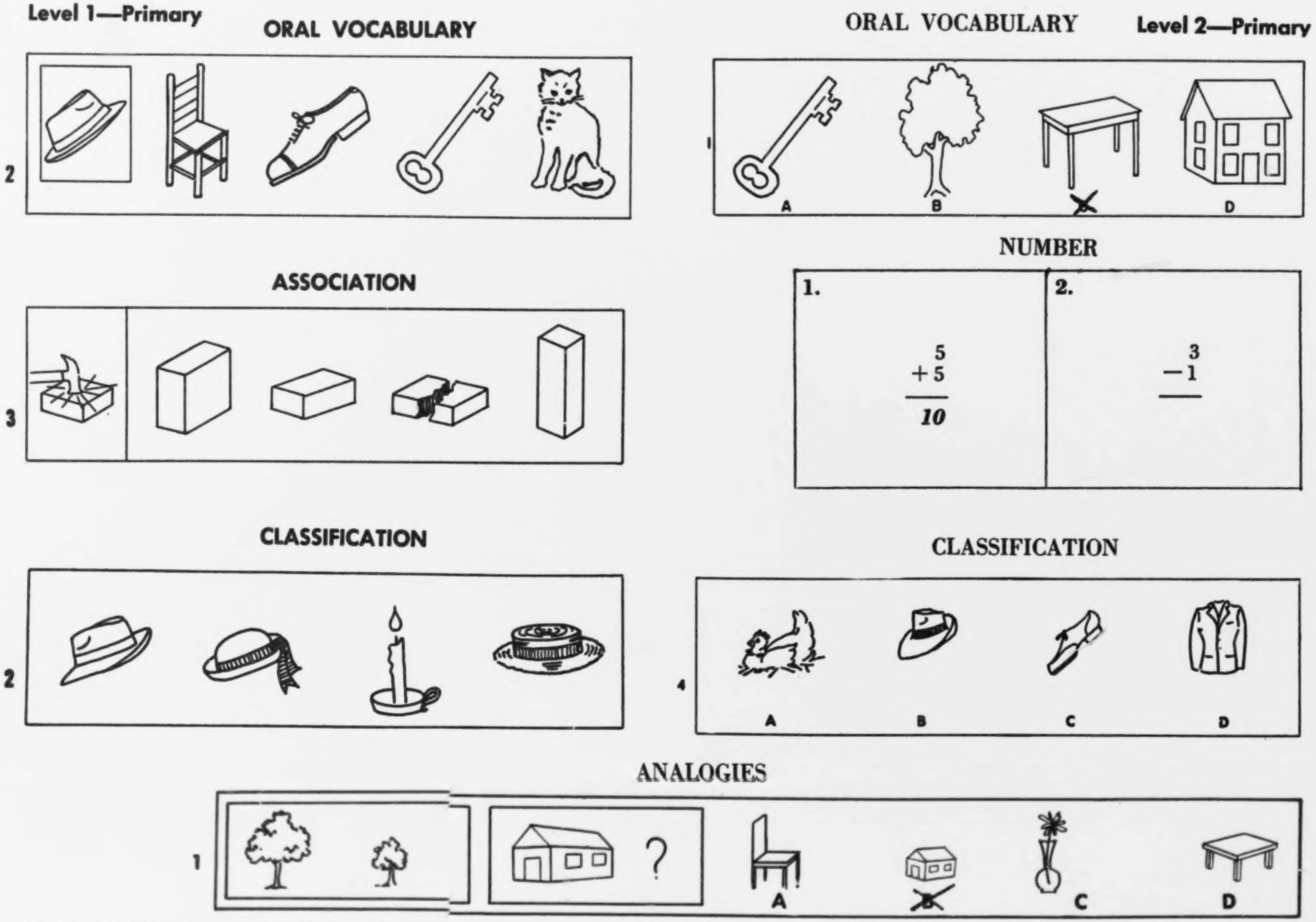

Level 1—Primary
ORAL VOCABULARY
2
ASSOCIATION
3
CLASSIFICATION
2
ORAL VOCABULARY
Level 2—Primary
1
A
B
D
NUMBER
1.
5
+5
10
2.
3
−1
CLASSIFICATION
4
A
B
C
D
ANALOGIES
1
?
A
C
D

Figure 5. Illustrations of Materials, Tests of General Ability, Primary Levels.

The format of the Tests of General Ability, Level 2, is similar to that of the level 1 tests, a booklet of 12 pages, 8 1/2 x 11 inches, with the short axis perpendicular to the child. Samples of the materials drawn from the Practice Exercises are shown in Figure 5. At level 2 the examiner calls attention to an item by number, and the child indicates his response by placing a cross on a letter below the drawing which he chooses. The content of the level 2 tests is generally similar to that of level 1, but Number includes both oral and written items, and (picture) Analogies is substituted for Association.

General Ability, Level 3. GA-3-CE, GA-3-DE; HG-3-CEs, HG-3-DEs.
Level 4. GA-4-CE, GA-4-DE; HG-4-CEs, HG-4-DEs.
Level 5. GA-5-CE, GA-5-DE; HG-5-CEs, HG-5-DEs.

The Tests of General Ability at levels 3, 4, and 5 follow the same general pattern--booklets of 16 pages, 8 1/2 x 11 inches, with materials for six parts, which combine to yield three subscores.

Parts and Subtests	Number of Items		Time Exclusive of Directions	
1. Sentence Completion	25		10 minutes	(old 15)
2. (Figure) Analogies	24		8 minutes	(old 10)
3. Computation	26		8 minutes	(old 10)
4. Word Relations	25		8 minutes	(old 10)
5. (Figure) Classification	26		8 minutes	(old 10)
6. Number Series	24		10 minutes	(old 15)
Verbal (1+4)		50		18 minutes
Nonverbal (2+5)		50		16 minutes
Numerical (3+6)		50		18 minutes
Total Score		150		52 minutes

A separate answer sheet is provided for recording responses to the tests. The same answer sheet (one in English and one in Spanish) is used for the three levels and for both Form C and Form D. The order of the responses in each test is such that one scoring key is used for all Form C tests and another for all Form D tests. The positions of the correct answers are entirely different in the two forms.

The illustrations of Figures 6 and 7 drawn from the Practice Exercises show the nature of the materials. The Practice Exercises and the Directions are the same at all levels for each of the six parts except Classification.

Reading, Level 2. R-2-CE, R-2-DE; L-2-CEs, L-2-DEs.

Parts	Number of Items		Time Exclusive of Directions	
1. Level of Comprehension	40		10 minutes	(old 10)
2. Speed of Comprehension	30		5 minutes	(old 5)
3. Vocabulary	40		8 minutes	(old 8)
Total Score		110		23 minutes

All of the Tests of Reading yield three subscores--Level of Comprehension, Speed of Comprehension, and Vocabulary--each from a separate part of the test. At level 2, drawings are used in Parts 1 and 2 (Level and Speed of Comprehension) as answers, and in Part 3 (Vocabulary) as the stimuli for the word to be chosen. The tests are printed in booklets of 12 pages, 8 1/2 x 11 inches. The materials are illustrated in Figure 8.

PART I, SENTENCE COMPLETION

In each sentence find the word which has been left out.

R1 The chain was so strong that it could not be –?–.

A sold **B** seen **C** heard **D** broken
E found

En cada oración busque la palabra que se ha omitido.

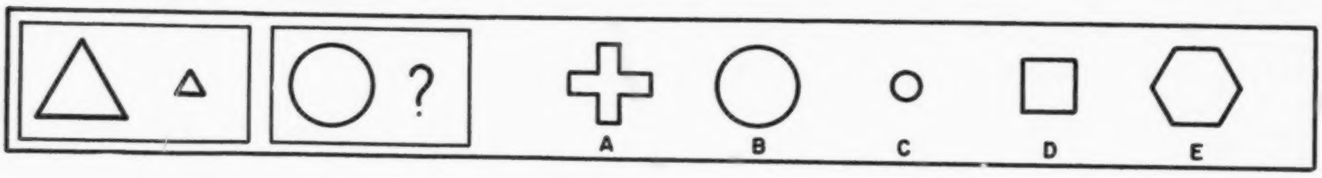
R1 La cadena era tan fuerte que no se podía –?–.
A vender **B** ver **C** oír **D** romper
E encontrar

PART II, ANALOGIES

In each row find the drawing which will make the second pair of drawings like the first pair.

En cada fila busque el dibujo que hará el segundo par de dibujos como el primer par.

S1



PART III, COMPUTATION

In each problem find the right answer.

T1

$$\begin{array}{r} 5 \\ +5 \\ \hline \end{array}$$

A 8
B 10
C 9
D 11
E None of these

T3 20 ÷ 5 = ?
A 3
B 5
C 6
D 4
E None of these

En cada problema busque la contestación correcta.

T1

$$\begin{array}{r} 5 \\ +5 \\ \hline \end{array}$$

A 8
B 10
C 9
D 11
E Ninguno de éstos

T3 20 ÷ 5 = ?
A 3
B 5
C 6
D 4
E Ninguno de éstos

PART IV, WORD RELATIONS

In each question find the word which completes the second pair.

En cada pregunta busque la palabra que completa el segundo par.

X3 ear hear — eye –?–
A pencil **B** nose **C** jump
D sleep **E** see

X3 oreja oír — ojo –?–
A lápiz **B** nariz **C** saltar
D dormir **E** ver

Figure 6. Illustrations of Materials, Tests of General Ability, Levels 3-5, Parts I-IV.

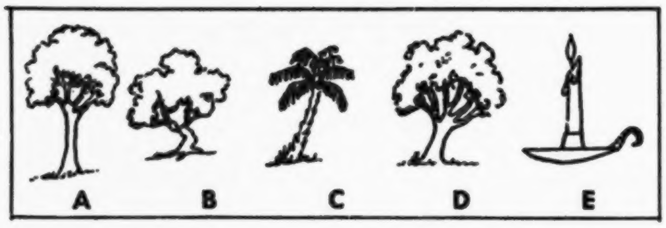
PART V, CLASSIFICATION

In each group of drawings find the one which does not go with the others.

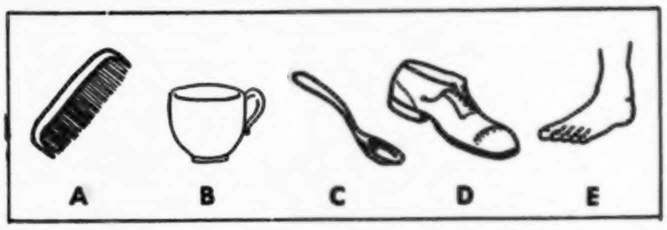
En cada grupo de dibujos busque el que no va con los otros.

Level 3

Y1

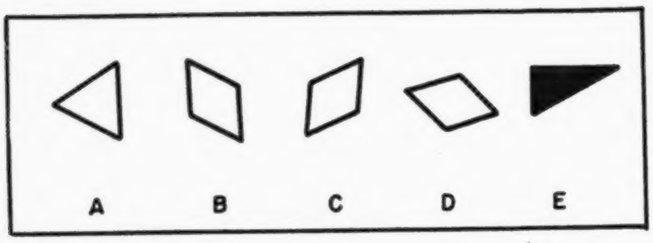


Y3

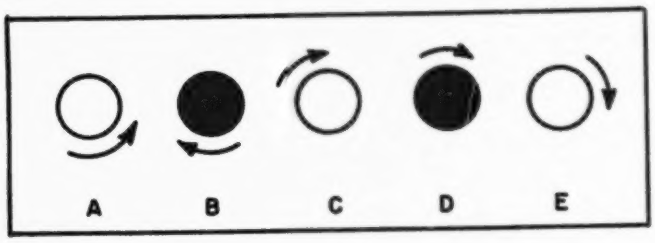


Level 4—Level 5

Y1



Y3



PART VI, NUMBER SERIES

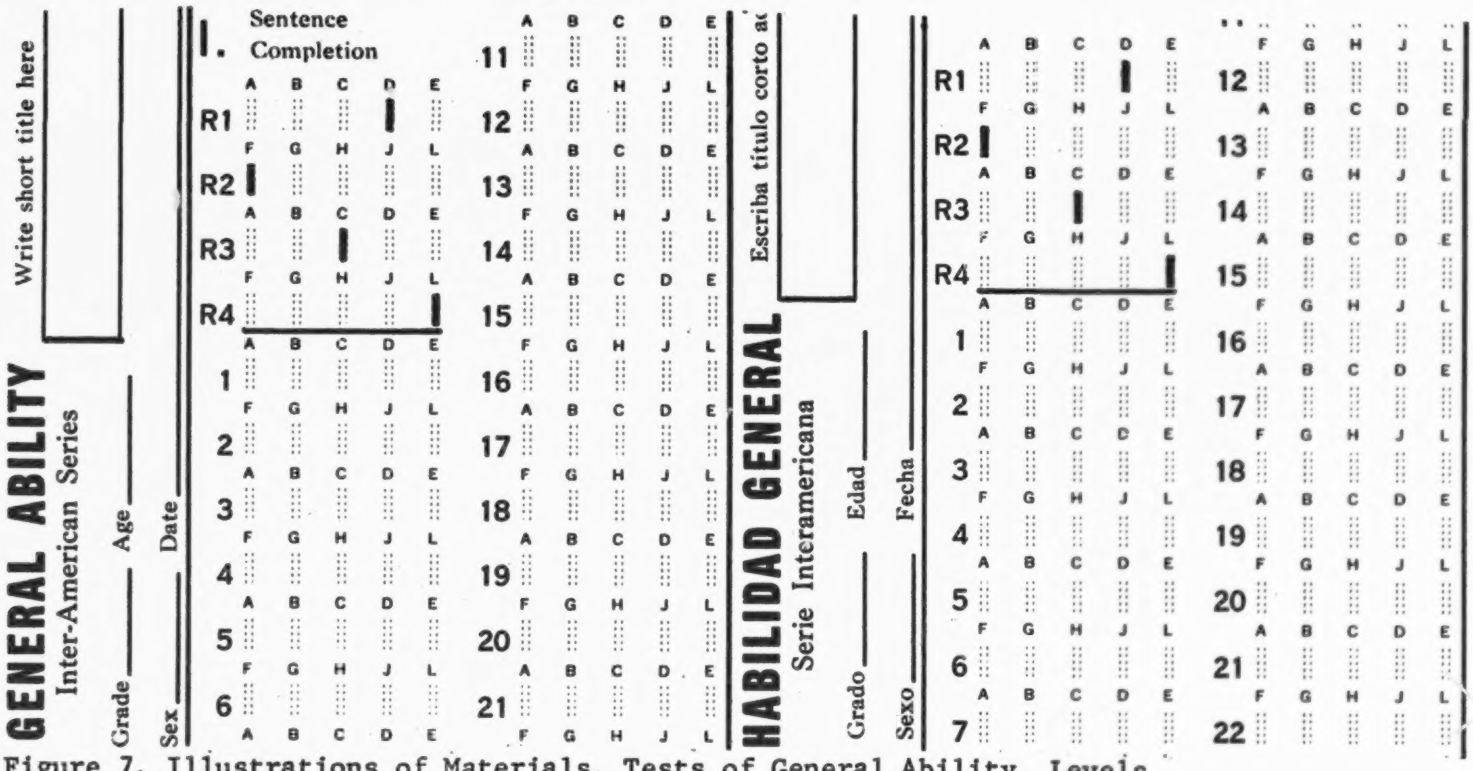
In each series of numbers find the number which comes next.

En cada serie de números busque el número que sigue.

Z1 1 2 3 4 5 ?

Z4 1 3 4 6 7 9 ?

ANSWER SHEETS



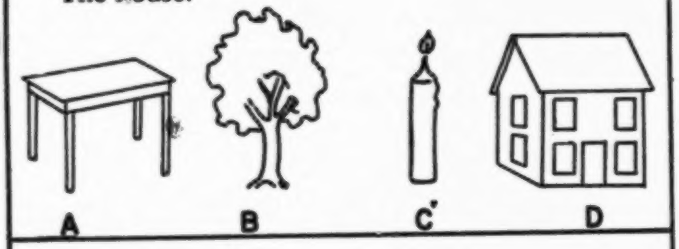
GENERAL ABILITY
Inter-American Series
Write short title here
Grade ____ Age ____
Sex ____ Date ____
I. Sentence Completion
R1 R2 R3 R4
1 2 3 4 5 6 11 12 13 14 15 16 17 18 19 20 21

HABILIDAD GENERAL
Serie Interamericana
Escriba título corto a
Grado ____ Edad ____
Sexo ____ Fecha ____
R1 R2 R3 R4
1 2 3 4 5 6 7 12 13 14 15 16 17 18 19 20 21 22

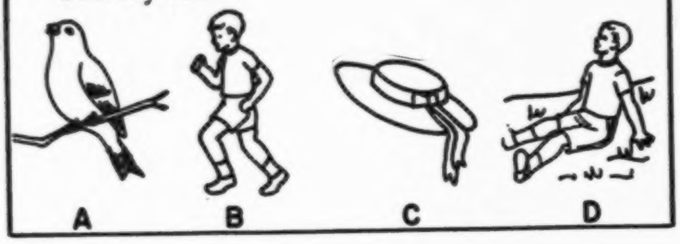
Figure 7. Illustrations of Materials, Tests of General Ability, Levels 3-5, Parts V-VI. — Also Answer Sheets.

PART I, READING: LEVEL

1 The house.

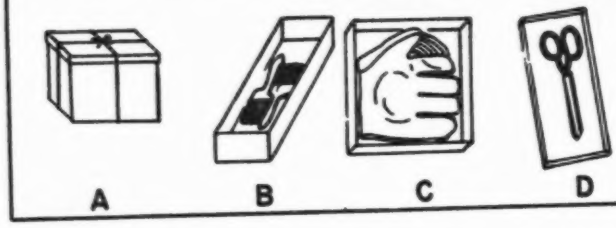


2 The boy runs.



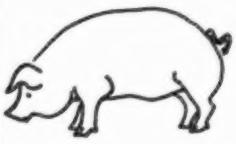
PART II, READING: SPEED

1 Joey wanted to help his father paint the house. So Father told him to get two paint brushes. He told him that he would find them in a long box.



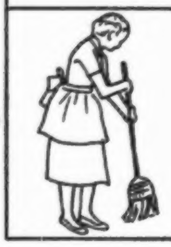
PART III, VOCABULARY

5



fat ○	that ○
hat ○	cat ○

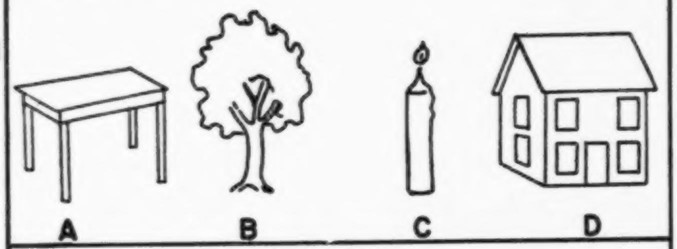
6



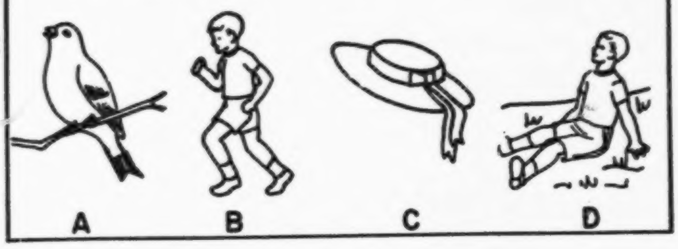
sweep ○	boil ○
bathe ○	swing ○

PARTE I, LECTURA: NIVEL

1 La casa.

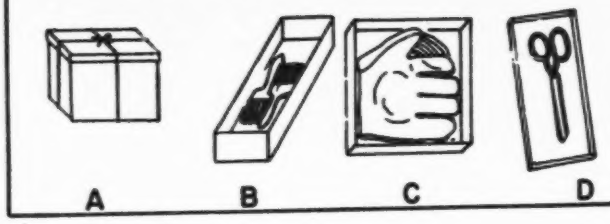


2 El niño corre.



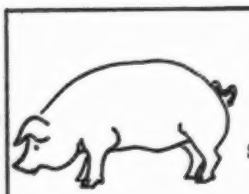
PARTE II, LECTURA: VELOCIDAD

1 José quería ayudar a su papá a pintar la casa. Así es que el papá le dijo que buscara dos brochas para pintar. Le dijo que las encontraría en una caja larga.



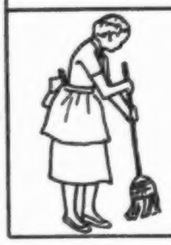
PARTE III, VOCABULARIO

5



gordo ○	aquel ○
sombrero ○	gato ○

6



barrer ○	hervir ○
bañar ○	mecer ○

Figure 8. Illustrations of Materials, Tests of Reading, Level 2.

PART I, VOCABULARY

In each question find the word which is defined or described.

X1 Something which gives light:

A table **B** candle **C** chair **D** bed **E** tree

PARTE I, VOCABULARIO

En cada pregunta busque la palabra que se define o se describe.

X1 Algo que da luz:

A mesa **B** vela **C** silla **D** cama **E** árbol

PART II, SPEED OF COMPREHENSION

In each sentence find the word which has been left out.

Y1 There was no moon, and there were so many clouds that the night was very –?–.

A short **B** near **C** dark **D** hot **E** dry

PARTE II, VELOCIDAD DE COMPRENSIÓN

En cada oración busque la palabra que falta.

Y1 No había luna, y había tantas nubes que la noche fue muy –?–.

A corta **B** cerca **C** obscura **D** caliente **E** seca

PART III, LEVEL OF COMPREHENSION

Read the paragraph and then find the answers to the questions.

On last Monday I saw something which was larger than an automobile. It had wings, and it could fly faster than an eagle. It was carrying passengers. It was not afraid of land or water.

Z1 What was it?

A boat **B** automobile **C** train **D** airplane **E** bird

Z3 What bird is named in the paragraph?

A sparrow **B** owl **C** swallow **D** dove **E** eagle

PARTE III, NIVEL DE COMPRENSIÓN

Lea el párrafo y luego busque las contestaciones a las preguntas.

El lunes pasado yo ví algo que era más grande que un automóvil. Tenía alas y podía volar más ligero que un águila. Llevaba pasajeros. No le tenía miedo ni a la tierra ni al agua.

Z1 ¿Qué era?

A un bote **B** un automóvil **C** un tren **D** un aeroplano **E** un pájaro

Z3 ¿Qué pájaro se nombra en el párrafo?

A un gorrión **B** un buho **C** una golondrina **D** una paloma **E** un águila

ANSWER SHEETS

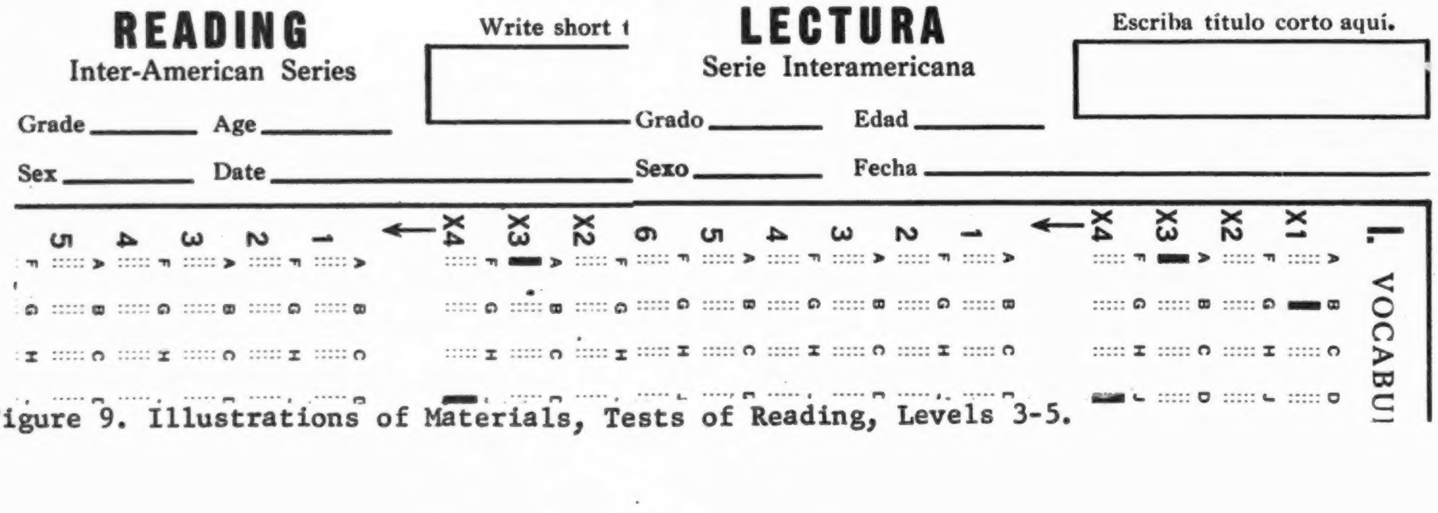

READING
Inter-American Series
Write short t
Grade
Age
Sex
Date
LECTURA
Serie Interamericana
Escriba título corto aquí.
Grado
Edad
Sexo
Fecha
I. VOCABU
X1
X2
X3
X4
1
2
3
4
5
6

Figure 9. Illustrations of Materials, Tests of Reading, Levels 3-5.

Reading, Level 3. R-3-CE, R-3-DE; L-3-CEs, L-3-DEs.
Level 4. R-4-CE, R-4-DE; L-4-CEs, L-4-DEs.
Level 5. R-5-CE, R-5-DE; L-5-CEs, L-5-DEs.

Parts	Number of Items	Time Exclusive of Directions	
1. Vocabulary	45	10 minutes	(old 10)
2. Speed of Comprehension	30	6 minutes	(old 5)
3. Level of Comprehension	50	25 minutes	(old 30)
Total Score	125	41 minutes	

The Tests of Reading at levels 3, 4, and 5 have the same general form. The same answer sheets serve for the three levels, one with English headings the other with Spanish, and the tests are so keyed that one scoring key serves for the C forms and another for the D forms. The materials are illustrated in Figure 9.

In the Vocabulary test the stem is a definition, a descriptive phrase, or a word suggesting the response. In Speed of Comprehension the task is to find a word omitted from the sentence in the stem. The items are arranged in cycles of similar difficulty, and the test is highly speeded. The Level of Comprehension is tested by questions based on paragraphs of generally increasing difficulty. All paragraphs were created for the earlier Inter-American Tests or for the new series.

Statistics

In many of the statistics, because of the limitations of our study, the number of cases is too small and the sampling too limited to give stable results. In some cases approximations from limited n's are not a serious lack; in others, larger n's are obviously desirable and should be provided by additional study.

Intercorrelations within Tests

The intercorrelations of the several parts of the Tests of General Ability, English edition, at selected grade levels are presented in Table 1, and the intercorrelations of the subscores in Table 2. Similar intercorrelations for the Spanish edition are found in Tables 3 and 4.

The correlations within the Tests of General Ability are sufficiently low to suggest that each division adds something to the total score. The median coefficient of correlation of the Verbal-Numerical scores with the Nonverbal scores of the full-length tests at level 1 and the tests at level 2 (both with the new time limits) is approximately .55 for the Spanish and English editions alike. The coefficient tends to be higher in grade 1 than in grade 2. The median coefficients of correlation at levels 3, 4, and 5 for the English and Spanish editions (with the new time limits) are .56 and .58 for Verbal with Nonverbal, .57 and .55 for Verbal with Numerical, and .54 and .47 for Nonverbal with Numerical. The lowest intercorrelations are at the college level.

The intercorrelations of the subtests of the Tests of Reading, English edition, at selected grade levels are given in Table 5, and similar intercorrelations for the Spanish edition in Table 6. The median coefficients for the English and Spanish editions are .72 and .64 for Vocabulary with Level of Comprehension, .64 and .61 for Vocabulary with Speed of Comprehension, and .74 and .62 for Speed with Level of Comprehension. The coefficients for the Spanish edition are lower than for the English edition, and the lowest coefficients for both editions are between Vocabulary and Speed of Comprehension. For the English edition the coefficients at the college level are lower than the coefficients at other levels, but for the Spanish edition they are about average.

Table 1
Tests of General Ability, English Edition - Intercorrelation of Parts

Level 1, GA-1-CE and GA-1-DE -- (The full-length tests):

Level	Grade	Form	Number	Part	Number Items	Oral V	Num	Asn	Clas
1	1	CE	287	Oral Vocabulary	25	1.00	.64	.55	.44
				Number	15	.64	1.00	.62	.56
				Association	20	.55	.62	1.00	.57
				Classification	20	.44	.56	.57	1.00
1	1	DE	305	Oral Vocabulary	25	1.00	.57	.39	.45
				Number	15	.57	1.00	.44	.54
				Association	20	.39	.44	1.00	.59
				Classification	20	.45	.54	.59	1.00

Level 1, GA-1-CE-A and GA-1-DE-A -- (The abbreviated tests):

1	K	CE-A	145	Oral Vocabulary	24	1.00	.52	.21	.34
				Number	8	.52	1.00	.30	.43
				Association	16	.21	.30	1.00	.34
				Classification	16	.34	.43	.34	1.00
1	K	DE-A	133	Oral Vocabulary	24	1.00	.50	.20	.20
				Number	8	.50	1.00	.35	.43
				Association	16	.20	.35	1.00	.43
				Classification	16	.20	.43	.43	1.00

Level 2, GA-2-CE and GA-2-DE:

2	2 and 3 together	CE	220	Oral Vocabulary	30	1.00	.00	.60	.78
				Number	30	.00	1.00	.24	.06
				Classification	24	.60	.24	1.00	.65
				Analogies	16	.78	.06	.65	1.00
2	2 and 3 together	DE	232	Oral Vocabulary	30	1.00	.47	.40	.33
				Number	30	.47	1.00	.35	.34
				Classification	24	.40	.35	1.00	.43
				Analogies	16	.33	.34	.43	1.00
2	3	CE	210	Oral Vocabulary	30	1.00	.24	.12	.20
				Number	30	.24	1.00	.16	.27
				Classification	24	.12	.16	1.00	.29
				Analogies	16	.20	.27	.29	1.00
2	3	DE	143	Oral Vocabulary	30	1.00	.34	.45	.31
				Number	30	.34	1.00	.29	.34
				Classification	24	.45	.29	1.00	.35
				Analogies	16	.31	.34	.35	1.00

Levels 3, 4, and 5, GA-3-CE and DE, GA-4-CE and DE, and GA-5-CE and DE — (Parts have 24, 25, or 26 items).

Level 3, GA-3-CE and GA-3-DE:

Level	Grade	Form	Number	Part	Sen Compl	Anal	Comp	W Rel	Clas	Num S
3	5	CE	95	Sentence Compl	1.00	.57	.50	.75	.32	.42
				Analogies	.57	1.00	.42	.58	.43	.45
				Computation	.50	.42	1.00	.50	.33	.55
				Word Relations	.75	.58	.50	1.00	.45	.48
				Classification	.32	.43	.33	.45	1.00	.38
				Number Series	.42	.45	.55	.48	.38	1.00
3	5	DE	56	Sentence Compl	1.00	.61	.54	.70	.19	.56
				Analogies	.61	1.00	.51	.54	.27	.49
				Computation	.54	.51	1.00	.45	.24	.58
				Word Relations	.70	.54	.45	1.00	.34	.56
				Classification	.19	.27	.24	.34	1.00	.20
				Number Series	.56	.49	.58	.56	.20	1.00
Level 4, GA-4-CE and GA-4-DE:										
4	8	CE and DE together	328	Sentence Compl	1.00	.46	.53	.63	.31	.46
				Analogies	.46	1.00	.49	.54	.50	.51
				Computation	.53	.49	1.00	.50	.40	.49
				Word Relations	.63	.54	.50	1.00	.38	.50
				Classification	.31	.50	.40	.38	1.00	.38
				Number Series	.46	.51	.49	.50	.38	1.00
Level 5, GA-5-CE and GA-5-DE:										
5	college	CE	1514	Sentence Compl	1.00	.33	.26	.60	.17	.30
				Analogies	.33	1.00	.32	.40	.39	.42
				Computation	.26	.32	1.00	.32	.19	.55
				Word Relations	.60	.40	.32	1.00	.23	.37
				Classification	.17	.39	.19	.23	1.00	.30
				Number Series	.30	.42	.55	.37	.30	1.00
5	college	DE	1505	Sentence Compl	1.00	.23	.17	.56	.16	.15
				Analogies	.23	1.00	.27	.29	.39	.35
				Computation	.17	.27	1.00	.25	.16	.51
				Word Relations	.56	.29	.25	1.00	.20	.29
				Classification	.16	.39	.16	.20	1.00	.29
				Number Series	.15	.35	.51	.29	.29	1.00

Table 2
Tests of General Ability, English Edition - Intercorrelation of Subtests

Level 1, GA-1-CE and GA-1-DE -- (The full-length tests):

Level	Grade	Form	Number	Subtest	Number Items	Nonverbal (40 items)
1	1	CE	287	Verbal-Numerical	40	.71
1	1	DE	305	Verbal-Numerical	40	.56

Level 1, GA-1-CE-A and GA-1-DE-A -- (The abbreviated tests):

						Nonverbal (32 items)
1	K	CE-A	138	Verbal-Numerical	32	.50
1	K	CE-A	145	Verbal-Numerical	32	.42
1	K	DE-A	133	Verbal-Numerical	32	.35

Level 2, GA-2-CE and GA-2-DE:

						Nonverbal (40 items)
2	2	CE	97	Verbal-Numerical	60	.45
2	2	DE	108	Verbal-Numerical	60	.43
2	3	CE	119	Verbal-Numerical	60	.27
2	3	DE	121	Verbal-Numerical	60	.55

Levels 3, 4, and 5, GA-3-CE and DE, GA-4-CE and DE, and GA-5-CE and DE -- (Each subtest has 50 items).

Level 3, GA-3-CE and GA-3-DE:

Level	Grade	Form	Number	Subtest	Nonverbal	Numerical
3	5	CE	95	Verbal	.63	.57
				Nonverbal	1.00	.54
3	5	DE	56	Verbal	.61	.65
				Nonverbal	1.00	.54

Level 4, GA-4-CE and GA-4-DE:

Level	Grade	Form	Number	Subtest	Nonverbal	Numerical
4	8	CE and DE together	328	Verbal	.56	.62
				Nonverbal	1.00	.60

Level 5, GA-5-CE and GA-5-DE:

Level	Grade	Form	Number	Subtest	Nonverbal	Numerical
5	college	CE	1514	Verbal	.38	.40
				Nonverbal	1.00	.41
5	college	DE	1505	Verbal	.30	.29
				Nonverbal	1.00	.36

Level 3 with longer time limits:

Level	Grade	Form	Number	Subtest	Nonverbal	Numerical
3	5	CE	104	Verbal	.66	.64
				Nonverbal	1.00	.57
3	5	DE	78	Verbal	.50	.67
				Nonverbal	1.00	.48

Level 4 with longer time limits:

4	8	CE	54	Verbal	.64	.69
				Nonverbal	1.00	.61

Level 5 with longer time limits:

5	11	CE	55	Verbal	.54	.42
				Nonverbal	1.00	.45
5	11	DE	49	Verbal	.58	.22
				Nonverbal	1.00	.45

Table 3
Tests of General Ability, Spanish Edition - Intercorrelation of Parts

Level 1, HG-1-CEs and HG-1-DEs -- (The full-length tests):

Level	Grade	Form	Number	Part	Number Items	Oral V	Num	Asn	Clas
1	1	CEs	205	Oral Vocabulary	25	1.00	.65	.58	.55
				Number	15	.65	1.00	.68	.69
				Association	20	.58	.68	1.00	.67
				Classification	20	.55	.69	.67	1.00
1	1	DEs	201	Oral Vocabulary	25	1.00	.61	.54	.59
				Number	15	.61	1.00	.53	.55
				Association	20	.54	.53	1.00	.64
				Classification	20	.59	.55	.64	1.00

Level 1, HG-1-CEs-A:

1	1	CEs-A	55	Oral Vocabulary	24	1.00	.33	.12	.32
				Number	8	.33	1.00	.48	.40
				Association	16	.12	.48	1.00	.34
				Classification	16	.32	.40	.34	1.00

Level 2, HG-2-CEs and HG-2-DEs:

								Clas	Anal
2	3	CEs	105	Oral Vocabulary	30	1.00	.40	.24	.41
				Number	30	.40	1.00	.36	.39
				Classification	24	.24	.36	1.00	.36
				Analogies	16	.41	.39	.36	1.00
2	3	DEs	104	Oral Vocabulary	30	1.00	.41	.29	.23
				Number	30	.41	1.00	.21	.34
				Classification	24	.29	.21	1.00	.22
				Analogies	16	.23	.34	.22	1.00

(Table 3 continues on next page.)

Levels 3, 4, and 5, HG-3-CEs, HG-4-CEs and DEs, and HG-5-CEs and DEs -- (Parts have 24, 25, or 26 items).

Level 3, HG-3-CEs:

Level	Grade	Form	Number	Part	Sen Compl	Anal	Comp	W Rel	Clas	Num S
3	5	CEs	119	Sentence Compl	1.00	.62	.48	.67	.44	.33
				Analogies	.62	1.00	.43	.63	.48	.36
				Computation	.48	.43	1.00	.44	.34	.57
				Word Relations	.67	.63	.44	1.00	.50	.27
				Classification	.44	.48	.34	.50	1.00	.30
				Number Series	.33	.36	.57	.27	.30	1.00

Level 4, HG-4-CEs and HG-4-DEs:

Level	Grade	Form	Number	Part	Sen Compl	Anal	Comp	W Rel	Clas	Num S
4	8	CEs	61	Sentence Compl	1.00	.57	.47	.58	.35	.22
				Analogies	.57	1.00	.32	.48	.40	.33
				Computation	.47	.32	1.00	.61	.36	.47
				Word Relations	.58	.48	.61	1.00	.51	.43
				Classification	.35	.40	.36	.51	1.00	.30
				Number Series	.22	.33	.47	.43	.30	1.00
4	8	DEs	48	Sentence Compl	1.00	.33	.43	.44	.20	.34
				Analogies	.33	1.00	.31	.60	.49	.53
				Computation	.43	.31	1.00	.23	.26	.37
				Word Relations	.44	.60	.23	1.00	.50	.58
				Classification	.20	.49	.26	.50	1.00	.45
				Number Series	.34	.53	.37	.58	.45	1.00

Level 5, HG-5-CEs and HG-5-DEs:

Level	Grade	Form	Number	Part	Sen Compl	Anal	Comp	W Rel	Clas	Num S
5	college	CEs	111	Sentence Compl	1.00	.34	.00	.32	.23	.05
				Analogies	.34	1.00	.34	.44	.39	.42
				Computation	.00	.34	1.00	.30	.11	.55
				Word Relations	.32	.44	.30	1.00	.22	.39
				Classification	.23	.39	.11	.22	1.00	.23
				Number Series	.05	.42	.55	.39	.23	1.00
5	college	DEs	106	Sentence Compl	1.00	.40	.22	.68	.36	.19
				Analogies	.40	1.00	.25	.41	.47	.44
				Computation	.22	.25	1.00	.34	.23	.48
				Word Relations	.68	.41	.34	1.00	.37	.35
				Classification	.36	.47	.23	.37	1.00	.46
				Number Series	.19	.44	.48	.35	.46	1.00

Table 4
Tests of General Ability, Spanish Edition - Intercorrelation of Subtests

Level 1, HG-1-CEs and HG-1-DEs -- (The full-length tests):

Level	Grade	Form	Number	Subtest	Number Items	Nonverbal (40 items)
1	1	CEs	205	Verbal-Numerical	40	.74
1	1	DEs	201	Verbal-Numerical	40	.68
1	1	DEs	57	Verbal-Numerical	40	.46

Level 1, HG-1-CEs-A -- (The abbreviated tests):

						Nonverbal (32 items)
1	1	CEs-A	55	Verbal-Numerical	32	.45

Level 2, HG-2-CEs and HG-2-DEs:

						Nonverbal (40 items)
2	2	CEs	107	Verbal-Numerical	60	.57
2	2	DEs	99	Verbal-Numerical	60	.55
2	3	CEs	105	Verbal-Numerical	60	.51
2	3	DEs	104	Verbal-Numerical	60	.41

Levels 3, 4, and 5, HG-3-CEs and DEs, HG-4-CEs and DEs, and HG-5-CEs and DEs -- (Each subtest has 50 items).

Level 3, HG-3-CEs and HG-3-DEs:

Level	Grade	Form	Number	Subtest	Nonverbal	Numerical
3	5	CEs	119	Verbal	.71	.45
				Nonverbal	1.00	.47

Level 3 with longer time limits:

Level	Grade	Form	Number	Subtest	Nonverbal	Numerical
3	5	CEs	149	Verbal	.69	.66
				Nonverbal	1.00	.66
3	5	DEs	90	Verbal	.68	.54
				Nonverbal	1.00	.53

Level 4, HG-4-CEs and HG-4-DEs:

Level	Grade	Form	Number	Subtest	Nonverbal	Numerical
4	8	CEs	61	Verbal Nonverbal	.65 1.00	.55 .45
4	8	DEs	48	Verbal Nonverbal	.57 1.00	.58 .58
Level 4 with longer time limits:						
4	8	CEs	100	Verbal Nonverbal	.51 1.00	.53 .53
4	8	DEs	101	Verbal Nonverbal	.66 1.00	.60 .57
Level 5, HG-5-CEs and HG-5-DEs:						
5	11	CEs	63	Verbal Nonverbal	.58 1.00	.61 .47
5	11	DEs	45	Verbal Nonverbal	.73 1.00	.66 .57
Level 5 with longer time limits:						
5	11	CEs	96	Verbal Nonverbal	.71 1.00	.57 .65
5	11	DEs	123	Verbal Nonverbal	.65 1.00	.53 .63
Level 5, HG-5-CEs and HG-5-DEs:						
5	college	CEs	111	Verbal Nonverbal	.46 1.00	.28 .37
5	college	DEs	106	Verbal Nonverbal	.49 1.00	.36 .45

Table 5
Tests of Reading, English Edition - Intercorrelation of Subtests

Level 2, R-2-CE and R-2-DE:

Level	Grade	Form	Number	Subtests	Number Items	Level	Speed	Vocab
2	2	CE	116	Level of Comp	40	1.00	.72	.78
				Speed of Comp	30	.72	1.00	.55
				Vocabulary	40	.78	.55	1.00
2	2	DE	75	Level of Comp	40	1.00	.67	.81
				Speed of Comp	30	.67	1.00	.49
				Vocabulary	40	.81	.49	1.00
2	3	CE	65	Level of Comp	40	1.00	.61	.32
				Speed of Comp	30	.61	1.00	.20
				Vocabulary	40	.32	.20	1.00
2	3	DE	89	Level of Comp	40	1.00	.82	.69
				Speed of Comp	30	.82	1.00	.61
				Vocabulary	40	.69	.61	1.00

Levels 3, 4, and 5, R-3-CE and DE, R-4-CE and DE, and R-5-CE and DE: Vocabulary (45 items); Speed of Comprehension (30 items); Level of Comprehension (50 items).

Level 3, R-3-CE and R-3-DE:

Level	Grade	Form	Number	Subtests	Vocab	Speed	Level
3	5	CE	72	Vocabulary	1.00	.76	.76
				Speed of Comp	.76	1.00	.79
				Level of Comp	.76	.79	1.00
3	5	DE	78	Vocabulary	1.00	.76	.86
				Speed of Comp	.76	1.00	.78
				Level of Comp	.86	.78	1.00

Level 4, R-4-CE and R-4-DE:

4	8	CE	38	Vocabulary	1.00	.71	.69
				Speed of Comp	.71	1.00	.79
				Level of Comp	.69	.79	1.00
4	8	DE	83	Vocabulary	1.00	.68	.68
				Speed of Comp	.68	1.00	.70
				Level of Comp	.68	.70	1.00

Level 5, R-5-CE and R-5-DE:

Level	Grade	Form	Number	Subtests	Vocab	Speed	Level
5	11	CE	39	Vocabulary	1.00	.67	.77
				Speed of Comp	.67	1.00	.76
				Level of Comp	.77	.76	1.00
5	11	DE	38	Vocabulary	1.00	.79	.84
				Speed of Comp	.79	1.00	.87
				Level of Comp	.84	.87	1.00
5	College	CE	1510	Vocabulary	1.00	.54	.65
				Speed of Comp	.54	1.00	.65
				Level of Comp	.65	.65	1.00
5	College	DE	1509	Vocabulary	1.00	.60	.69
				Speed of Comp	.60	1.00	.66
				Level of Comp	.69	.66	1.00

Table 6
Tests of Reading, Spanish Edition - Intercorrelation of Subtests

Level 2, L-2-CEs and L-2-DEs:

Level	Grade	Form	Number	Subtests	Number Items	Level	Speed	Vocab
2	2	CEs	270	Level of Comp	40	1.00	.55	.69
				Speed of Comp	30	.55	1.00	.49
				Vocabulary	40	.69	.49	1.00
2	3	CEs	305	Level of Comp	40	1.00	.62	.60
				Speed of Comp	30	.62	1.00	.34
				Vocabulary	40	.60	.34	1.00
2	3	DEs	42	Level of Comp	40	1.00	.82	.72
				Speed of Comp	30	.82	1.00	.79
				Vocabulary	40	.72	.79	1.00

Levels 3, 4, and 5, L-3-CEs and DEs, L-4-CEs and DEs, and L-5-CEs and DEs: Vocabulary (45 items); Speed of Comprehension (30 items); Level of Comprehension (50 items).

Level 3, L-3-CEs and L-3-DEs:

Level	Grade	Form	Number	Subtests	Vocab	Speed	Level
3	5	CEs	90	Vocabulary	1.00	.63	.68
				Speed of Comp	.63	1.00	.74
				Level of Comp	.68	.74	1.00
3	5	DEs	96	Vocabulary	1.00	.80	.79
				Speed of Comp	.80	1.00	.80
				Level of Comp	.79	.80	1.00

Level 4, L-4-CEs and L-4-DEs:

Level	Grade	Form	Number	Subtests	Vocab	Speed	Level
4	8	CEs	81	Vocabulary	1.00	.64	.73
				Speed of Comp	.64	1.00	.61
				Level of Comp	.73	.61	1.00
4	8	DEs	85	Vocabulary	1.00	.59	.59
				Speed of Comp	.59	1.00	.58
				Level of Comp	.59	.58	1.00

Level 5, L-5-CEs and L-5-DEs:

5	11	CEs	102	Vocabulary	1.00	.75	.60
				Speed of Comp	.75	1.00	.71
				Level of Comp	.60	.71	1.00
5	11	DEs	100	Vocabulary	1.00	.52	.56
				Speed of Comp	.52	1.00	.58
				Level of Comp	.56	.58	1.00
5	College	CEs and DEs	111,106	Vocabulary	1.00	.59	.61
				Speed of Comp	.59	1.00	.63
	(Mean of two coefficients)			Level of Comp	.61	.63	1.00

Reliability

The index of reliability used in this study is the correlation of the raw scores of Form C and Form D administered to the same groups after a relatively short interval. The tables list approximate values. Each coefficient is based on tests administered in the same order—CE to DE or DE to CE. The order of administration, the number of cases, the coefficient of correlation, the means, and the standard deviations are listed.

Reliability coefficients for subscores and total scores at selected grade levels are recorded in Tables 7 to 10. The coefficients for the Total scores of the English and Spanish editions of the Tests of General Ability are remarkably similar, with median values of .79 or .80 for the primary grades and about .88 for the grades included above the primary level. The coefficients of the kindergarten scores, some of which were on the abbreviated form of the tests at level 1, are a little lower than the coefficients based on the scores of grades 1 and 2. The tests with longer time limits at the higher levels have a median correlation coefficient of about .91 for both the English and the Spanish editions. As would be expected, the reliability coefficients computed for the part scores are generally lower than the coefficients for the total scores.

The median reliability coefficients based on the Total scores of the Tests of Reading are higher for the English edition than for the Spanish edition—around .90 in both primary and advanced grades for the English edition, and around .72 in the primary grades and around .85 in the grades above the primary level for the Spanish edition. The reliability of the part scores is generally less than the reliability of the total scores. The coefficients for the Speed of Comprehension tend to be lower than other coefficients, reflecting in some cases the relatively small number of items answered.

Table 7
Tests of General Ability, English Edition - Reliability Coefficients

Level	Grade	First Test	Number	Score	r	Mean		Standard Deviation	
						CE	DE	CE	DE
Level 1, GA-1-CE and GA-1-DE -- (The full-length tests): Verbal-Numerical (40 items); Nonverbal (40 items); Total (80 items).									
1	1	CE	287	V-N	.83	27	28	6.3	5.7
				Nv	.83	25	27	7.7	7.4
				Total	.89	52	55	12.9	12.4
1	1	DE	305	V-N	.73	29	29	5.3	4.9
				Nv	.72	29	27	6.4	6.4
				Total	.79	58	56	10.3	9.9
1	K	DE	116	V-N	.57	28	28	4.3	4.5
				Nv	.69	24	22	6.4	7.3
				Total	.75	53	50	9.5	10.5
Level 1, GA-1-CE-A and GA-1-DE-A -- (The abbreviated tests): Verbal-Numerical (32 items); Nonverbal (32 items); Total (64 items).									
1	K	CE-A	145	V-N	.70	22	22	5.1	4.0
				Nv	.61	20	21	4.7	4.4
				Total	.73	43	43	8.3	7.1
1	K	DE-A	133	V-N	.75	21	22	4.8	5.0
				Nv	.64	22	20	4.3	4.6
				Total	.78	42	42	7.9	7.8
Level 2, GA-2-CE and GA-2-DE: Verbal-Numerical (60 items); Nonverbal (40 items); Total (100 items).									
2	2	CE	97	V-N	.81	31	33	5.5	6.3
				Nv	.67	26	28	4.9	4.9
				Total	.82	57	61	8.9	9.9
2	2	DE	108	V-N	.72	31	29	4.7	5.7
				Nv	.64	27	26	5.0	5.4
				Total	.76	57	55	7.7	9.3

Level	Grade	First Test	Number	Score	r	Mean		Standard Deviation	
						CE	DE	CE	DE
2	3	CE	119	V-N	.70	40	41	4.3	5.0
				Nv	.53	29	32	4.4	4.4
				Total	.72	68	73	7.0	8.0
2	3	DE	121	V-N	.74	39	39	5.6	5.7
				Nv	.72	29	28	4.8	5.6
				Total	.82	69	67	9.1	10.0

Levels 3, 4, and 5, GA-3-CE and DE, GA-4-CE and DE, and GA-5-CE and DE: Verbal (50 items); Nonverbal (50 items); Numerical (50 items); Total (150 items).

Level 3, GA-3-CE and GA-3-DE:

3	5	CE	95	V	.86	35	35	8.6	7.2
				Nv	.75	37	39	6.8	6.8
				Num	.85	34	37	8.3	7.5
				Total	.90	106	110	20.1	18.9
3	5	DE	56	V	.88	36	32	8.9	7.6
				Nv	.67	39	35	7.0	7.5
				Num	.85	33	32	8.7	8.6
				Total	.88	107	99	21.6	20.2

Level 3 with longer time limits:

3	5	CE	104	V	.90	35	34	9.1	8.6
				Nv	.77	37	37	8.3	8.9
				Num	.80	32	33	8.3	9.2
				Total	.91	103	104	22.2	23.1
3	5	DE	78	V	.86	38	36	8.0	7.2
				Nv	.73	41	37	6.4	6.5
				Num	.81	36	35	7.1	7.1
				Total	.86	115	109	18.2	17.4

Level 4, GA-4-CE and GA-4-DE:

4	8	CE	31	V	.82	43	42	4.3	3.9
				Nv	.41	42	44	3.4	3.7
				Num	.65	39	43	4.6	4.7
				Total	.75	124	129	9.3	9.3

Level 4 with longer time limits:

4	8	CE	54	V	.85	38	38	7.1	7.3
				Nv	.73	42	44	4.8	6.1
				Num	.89	36	38	9.8	9.6
				Total	.94	116	120	19.2	21.0

Level 5 with longer time limits:

Level	Grade	First Test	Number	Score	r	Mean CE	Mean DE	Standard Deviation CE	Standard Deviation DE
5	11	CE	45	V	.85	29	31	8.4	9.3
				Nv	.70	36	40	6.3	4.8
				Num	.84	29	35	8.8	8.5
				Total	.91	94	106	20.2	18.9
5	11	DE	49	V	.77	38	39	5.5	5.4
				Nv	.66	43	41	3.9	4.3
				Num	.75	43	40	5.0	5.5
				Total	.86	125	121	11.6	11.7

Table 8
Tests of General Ability, Spanish Edition - Reliability Coefficients

Divisions of tests and numbers of items are the same as in the English edition. Unless otherwise noted, the statistics are based on tests administered in Puerto Rico.

Level 1, HG-1-CEs and HG-1-DEs:

Level	Grade	First Test	Number	Score	r	Mean CEs	Mean DEs	Standard Deviation CEs	Standard Deviation DEs
1	1	CEs	205	V-N	.81	22	25	6.9	6.3
				Nv	.83	13	15	8.6	8.3
				Total	.89	35	40	14.4	13.5
1	1	DEs	201	V-N	.80	23	23	7.0	6.6
				Nv	.79	15	14	9.1	8.5
				Total	.88	37	36	15.3	13.9
Level 1 (administered to Spanish-speaking children in Texas):									
1	1	CEs	24	V-N	.60	24	25	4.0	3.5
				Nv	.45	22	26	5.3	4.1
				Total	.59	46	51	6.5	6.2
1	1	DEs	22	V-N	.69	22	23	5.4	3.9
				Nv	.79	21	18	6.1	7.6
				Total	.88	43	40	10.5	10.1
Level 2, HG-2-CEs and HG-2-DEs:									
2	2	CEs	107	V-N	.71	25	26	6.2	5.6
				Nv	.63	17	19	5.8	5.0
				Total	.77	42	45	10.6	9.2
2	2	DEs	99	V-N	.67	26	24	6.0	6.1
				Nv	.64	17	15	5.5	5.4
				Total	.71	43	40	10.1	10.2

Level	Grade	First Test	Number	Score	r	Mean		Standard Deviation	
						CEs	DEs	CEs	DEs
2	3	CEs	105	V-N	.79	33	35	6.8	6.5
				Nv	.61	20	22	5.6	5.6
				Total	.80	53	56	10.8	10.8
2	3	DEs	104	V-N	.75	35	34	6.0	5.7
				Nv	.49	22	19	4.8	5.1
				Total	.75	57	52	9.2	9.1
Level 3, HG-3-CEs:									
3	5	CEs	119	V	.82	24	26	9.1	9.0
				Nv	.75	23	26	8.6	9.4
				Num	.74	21	22	8.2	9.5
				Total	.83	68	74	21.6	23.9
Level 4, HG-4-CEs and HG-4-DEs:									
4	8	CEs	61	V	.82	32	34	9.5	9.5
				Nv	.82	30	35	8.9	8.5
				Num	.74	23	28	6.9	8.0
				Total	.88	84	97	21.3	22.2
4	8	DEs	48	V	.91	30	29	8.8	8.7
				Nv	.75	32	28	8.4	8.1
				Num	.85	24	21	8.4	6.9
				Total	.90	86	79	22.3	20.1
Level 5, HG-5-CEs and HG-5-DEs:									
5	11	CEs	63	V	.83	22	23	6.8	8.3
				Nv	.73	26	31	7.0	7.1
				Num	.77	15	18	6.0	6.7
				Total	.88	63	72	16.6	18.5
5	11	DEs	45	V	.84	23	23	6.9	8.5
				Nv	.85	27	25	9.2	8.4
				Num	.76	15	14	7.2	6.5
				Total	.90	65	62	20.3	20.6

Level 3 with longer time limits:

Level	Grade	First Test	Number	Score	r	Mean		Standard Deviation	
						CEs	DEs	CEs	DEs
3	5	CEs	149	V	.79	28	31	9.4	8.6
				Nv	.80	26	30	10.4	10.3
				Num	.87	22	27	8.9	9.8
				Total	.88	77	88	25.4	25.4
3	5	DEs	90	V	.76	29	26	9.6	9.1
				Nv	.82	29	25	9.7	9.3
				Num	.82	28	21	9.3	9.5
				Total	.90	86	72	24.3	23.7
Level 4 with longer time limits:									
4	8	CEs	100	V	.80	27	29	7.7	7.4
				Nv	.80	29	32	7.4	7.5
				Num	.77	21	26	7.2	7.7
				Total	.89	77	87	18.4	18.9
4	8	DEs	101	V	.82	33	30	8.4	7.9
				Nv	.85	33	31	8.6	8.1
				Num	.84	25	25	7.6	7.4
				Total	.92	91	85	21.3	20.2
Level 5 with longer time limits:									
5	11	CEs	96	V	.87	25	28	7.9	9.5
				Nv	.82	30	33	8.3	8.4
				Num	.85	18	20	7.9	9.0
				Total	.95	72	80	21.1	23.8
5	11	DEs	123	V	.85	24	24	7.2	8.8
				Nv	.83	32	29	8.2	8.2
				Num	.80	19	17	8.1	7.4
				Total	.91	75	70	19.7	20.9

Table 9
Tests of Reading, English Edition - Reliability Coefficients

Level 2, R-2-CE and R-2-DE: Level of Comprehension (40 items); Speed of Comprehension (30 items); Vocabulary (40 items); Total (110 items).

Level	Grade	First Test	Number	Score	r	Mean		Standard Deviation	
						CE	DE	CE	DE
2	2	CE	116	Level	.74	14	19	5.9	6.2
				Speed	.49	6	7	2.9	3.7
				Vocab	.75	18	19	6.5	5.9
				Total	.85	38	45	13.8	13.2
2	2	DE	75	Level	.90	20	19	7.3	6.5
				Speed	.68	9	7	4.5	3.8
				Vocab	.80	22	23	7.9	8.0
				Total	.90	51	49	18.0	16.4
2	3	CE	65	Level	.74	27	29	5.8	5.9
				Speed	.87	16	17	7.4	7.2
				Vocab	.66	27	29	6.8	6.8
				Total	.89	70	75	15.2	15.7
2	3	DE	89	Level	.83	29	26	7.1	6.5
				Speed	.78	17	14	7.7	6.1
				Vocab	.86	29	29	6.7	7.3
				Total	.92	75	69	18.4	17.7

Levels 3, 4, and 5, R-3-CE and DE, R-4-CE and DE, and R-5-CE and DE: Vocabulary (45 items); Speed of Comprehension (30 items); Level of Comprehension (50 items); Total (125 items).

Level 3, R-3-CE and R-3-DE:

3	5	CE	72	Vocab	.78	21	25	9.1	8.0
				Speed	.83	13	15	5.8	5.5
				Level	.87	26	28	9.9	9.9
				Total	.91	60	68	22.8	21.3
3	5	DE	78	Vocab	.89	22	23	8.9	8.4
				Speed	.84	14	14	6.1	5.2
				Level	.91	27	27	11.1	10.9
				Total	.95	63	64	24.8	23.1

Level 4, R-4-CE and R-4-DE:

4	8	CE	38	Vocab	.76	23	24	6.3	6.1
				Speed	.77	18	14	6.7	4.6
				Level	.80	25	26	7.2	8.1
				Total	.91	67	65	18.3	16.7

Level	Grade	First Test	Number	Score	r	Mean		Standard Deviation	
						CE	DE	CE	DE
4	8	DE	83	Vocab	.73	23	22	6.2	5.6
				Speed	.72	14	12	5.0	4.0
				Level	.75	23	25	8.7	6.8
				Total	.86	60	59	17.8	14.6

Level 5, R-5-CE and R-5-DE:

Level	Grade	First Test	Number	Score	r	Mean CE	Mean DE	SD CE	SD DE
5	11	CE	39	Vocab	.85	30	31	7.0	7.8
				Speed	.74	15	19	6.0	6.6
				Level	.79	27	29	8.5	7.6
				Total	.90	73	78	19.5	20.4
5	11	DE	38	Vocab	.94	27	28	7.6	7.8
				Speed	.87	13	14	6.6	6.8
				Level	.76	22	26	6.3	7.4
				Total	.93	62	68	18.4	20.7

Table 10
Tests of Reading, Spanish Edition - Reliability Coefficients

Divisions of tests and numbers of items are the same as in the English edition. The statistics are based on tests administered in Puerto Rico.

Level 2, L-2-CEs:

Level	Grade	First Test	Number	Score	r	Mean		Standard Deviatio	
						CEs	DEs	CEs	DEs
2	2	CEs	270	Level	.61	12	14	6.5	5.7
				Speed	.42	8	7	4.8	4.5
				Vocab	.63	14	17	10.1	10.1
				Total	.74	34	38	18.3	16.5
2	3	CEs	305	Level	.65	20	20	6.8	6.0
				Speed	.39	11	12	6.4	5.3
				Vocab	.66	23	25	8.9	8.2
				Total	.71	53	57	18.2	16.9

Level 3, L-3-CEs and L-3-DEs:

Level	Grade	First Test	Number	Score	r	Mean CEs	Mean DEs	SD CEs	SD DEs
3	5	CEs	90	Vocab	.69	12	16	6.3	5.9
				Speed	.64	5	9	3.2	3.9
				Level	.80	13	14	6.9	6.9
				Total	.87	31	39	14.6	15.2
3	5	DEs	96	Vocab	.85	17	12	8.4	7.9
				Speed	.77	7	7	4.7	4.2
				Level	.80	13	11	6.7	7.5
				Total	.90	37	31	18.0	18.3

Level 4, L-4-CEs and L-4-DEs:

Level	Grade	First Test	Number	Score	r	Mean		Standard Deviation	
						CEs	DEs	CEs	DEs
4	8	CEs	81	Vocab	.78	19	21	6.3	6.1
				Speed	.69	11	11	4.9	4.8
				Level	.78	17	18	6.5	6.1
				Total	.87	47	49	15.5	14.8
4	8	DEs	85	Vocab	.68	18	17	6.5	5.8
				Speed	.65	11	9	5.3	4.5
				Level	.69	16	16	5.4	6.0
				Total	.84	45	42	15.5	13.9

Level 5, L-5-CEs and L-5-DEs:

5	11	CEs	102	Vocab	.73	23	24	5.7	5.2
				Speed	.68	15	13	5.7	5.0
				Level	.55	20	20	4.8	5.1
				Total	.78	57	56	14.5	13.2
5	11	DEs	100	Vocab	.81	20	21	6.2	6.4
				Speed	.48	10	8	4.1	3.2
				Level	.53	17	16	5.2	5.0
				Total	.82	47	46	13.5	12.3

Equivalence of Forms C and D

Using the equi-percentile method described in the previous chapter, we have equated the scores on Forms C and D. Because of the limited sampling and limited number of cases, the equated scores must be considered tentative. Table 11 lists the numbers in the various groups whose scores were tabulated for a comparison of the two forms. In some groups both Forms C and D were given to all members, and in others the two forms were distributed alternately for the testing. Equivalent Form C and Form D scores are shown in the percentile tables of the division devoted to norms. In these tables Form C part scores are listed at intervals of 2 and total scores at intervals of 4. A parallel column gives the equivalent D score.

Table 11
Number of Scores Tabulated for Estimating Equivalence of Form C and Form D Scores

	General Ability			Reading			
	Both Forms(1)		One Form(1)	Both Forms(1)		One Form(1)	
Level	English	Spanish	English	English	Spanish	English	Spanish
1 (Full length)	441	406					
1 (Abbreviated)	278						
2	445 297(2)	771		411	575	343	621
3	298 602(2)	340(3)		463	571	659	
4	62 162(2)	352	375	388	503	355	198
5	247(2)	329	3019	249	612	3019	203

(1) The "both forms" columns include those who took both Form C and Form D. The "one form" columns include those who took Form C or Form D in an alternate distribution of the tests, some of the group taking Form C and others Form D.

(2) These groups were tested with the longer time limits used first in the tryout of the tests.

(3) This group was of little or no value because all of the tests were administered in the same order without a matching group in the reverse order.

Equivalence of Scores at Different Levels

A continuous scale into which the Form CE and CEs raw scores of the Tests of General Ability, Levels 2-5, may be translated is presented in Table 13, and a similar scale for the Tests of Reading in Table 14. The scales are entirely arbitrary and their units are probably unequal at different levels. The raw test scores have been fitted to the continuous scale by assigning selected raw scores of Level 5 to selected scale values and then working back to Level 2 scores by equating the tests at overlapping points and adapting the raw scores of each level in turn to the scale units. The equated raw scores were based on the administration of Form D tests and then translated into Form C units for the scale. In this procedure there is a great deal of approximation and the results should be checked by further studies. The numbers primarily used in the equating are given in Table 12.

Table 12
Number of Scores Tabulated for Estimating Equivalence of Scores at Different Levels

	General Ability			Reading		
	Both-Level(1)		One-Level(1)	Both-Level(1)		One-Level(1)
Levels Equated	English	Spanish	English	English	Spanish	English
Level 2 and Level 3(2)	206	(268)		349	(260)	
Level 3 and Level 4	113	272	100	118	258	226
Level 4 and Level 5	135	265	201	171	262	216

(1) The "both-level" columns include those who took tests at both levels. The "one-level" columns indicate those who took the tests at one level in an alternate distribution of tests, some of the group taking tests at the lower level and some at the higher level.

(2) Equivalence of Level 2 and Level 3 scores was based on the English edition. The scores of Level 3 of the Spanish edition seem to have been depressed in relation to the scores of Level 2, possibly because answer sheets were used at Level 3 and not at Level 2.

Table 13
Tests of General Ability—Scaled Scores and Estimated Equivalent Form C Scores Levels 2-5

Scaled Score	Level 2	Level 3	Level 4	Level 5
348				148
344				144
340				140
336				136
332				132
328				128
324			140	124
320			138	120
316			136	116
312			134	112
308			131	108
304			129	104
300			127	100
296			124	96
292			121	92
288			118	88
284		140	114	84
280		138	110	80
276		135	106	76
272		133	102	73
268		130	98	70
264		127	94	67
260		124	90	64
256		120	86	61
252		117	82	58
248		115	78	55
244		112	74	52
240	89	109	70	50
236	87	105	66	48
232	85	101	62	46
228	84	97	59	44
224	82	93	55	43
220	80	89	52	41
216	79	85	50	40
212	78	81	48	39
208	76	77	46	38
204	74	73	44	
200	73	69	41	
196	71	65	39	
192	69	61	37	
188	67	57	35	
184	65	53	33	
180	62	48		
176	58	43		
172	54	38		
168	50	33		
164	46			
160	42			
156	38			
152	34			
148	30			
144	26			
140	22			

Table 14
Tests of Reading—Scaled Scores and Estimated Equivalent Form C Scores, Levels 2-5

Scaled Score	Level 2	Level 3	Level 4	Level 5
352				120
348				116
344				112
340				108
336				104
332				100
328			120	96
324			116	92
320			112	88
316			108	84
312			104	80
308			100	76
304			96	72
300		119	93	68
296		116	89	64
292		112	85	60
288		109	81	56
284		106	77	53
280		103	73	50
276		99	69	47
272	108	95	65	44
268	107	92	61	42
264	106	88	57	40
260	105	84	53	38
256	103	80	50	36
252	102	76	47	34
248	100	72	45	32
244	99	68	43	
240	98	64	41	
236	96	60	38	
232	94	56	36	
228	92	52	34	
224	90	48	32	
220	87	44	29	
216	84	40	26	
212	80	36	23	
208	76	32		
204	72	29		
200	68	27		
196	64	25		
192	60			
188	56			
184	52			
180	48			
176	44			
172	40			
168	36			
164	32			
160	28			
156	24			
152	20			

Validity

The term validity refers both to the nature of the test (what it measures) and to the use which may be made of the results. For example, do our Tests of General Ability measure the ability of a child to work with verbal concepts, to reason in situations presented by drawings, to compute and reason with numbers, and to do intellectual work in general? Do our Tests of Reading measure the extent of a child's vocabulary, the speed with which he can read at a given level, his ability to understand written material, and his reading ability in general? Then, what can we do with the test scores besides understanding what they measure? For one thing, can they be used for predicting the future when a teacher needs help in placement or guidance?

The problem of the validity of the Inter-American Tests, as of other tests, is best approached from the standpoint of learning their content, becoming acquainted with the scores which they yield in different situations, and studying their relation to other tests and to information from other sources. A general coefficient of validity would be meaningless and misleading. An adequate concept of the validity of the Inter-American Series can be developed only through experience and experiment with the tests. But we do not have to start from scratch. Educators have had a great deal of experience with materials similar to those used in the tests, and our test construction project has given a start toward understanding the new tests.

Correlation with Other Tests and with Grades

Correlations of our Level 2 Reading Test with the Stanford Achievement Reading Test are presented in Table 15 and correlations with the Metropolitan Reading Test in Table 16. The latter table includes also two coefficients for Level 3. The correlation of part scores ranges from .59 to .87, with a median of .69.

Table 15
Tests of Reading - Correlation with Stanford Achievement
Reading Test Grade Scores

Level	Grade	Number	Form	Inter-American Series	Stanford Achievement	r
2	2	140	CE	Level of Comprehension	Paragraph Meaning	.59
				Vocabulary	Word Meaning	.67
				Total	Average	.75

Table 16
Tests of Reading - Correlation with Metropolitan Reading Test

Level	Grade	Number	Form	Inter-American Series	Metropolitan grade scores	r
2	2	90	CE	Level of Comprehension	Reading	.61
				Vocabulary	Word Knowledge	.72
2	2	102	DE	Level of Comprehension	Reading	.66
				Vocabulary	Word Knowledge	.76
					Metropolitan raw scores	
2	2	95	CE	Level of Comprehension	Reading	.65
				Vocabulary	Word Knowledge	.78
2	2	40	CE	Level of Comprehension	Reading	.61
				Vocabulary	Word Knowledge	.61
2	2	43	DE	Level of Comprehension	Reading	.74
				Vocabulary	Word Knowledge	.61
2	3	28	CE	Level of Comprehension	Reading	.68
				Vocabulary	Word Knowledge	.65
2	3	32	DE	Level of Comprehension	Reading	.71
				Vocabulary	Word Knowledge	.87
2	4	122	DE	Level of Comprehension	Reading	.80
				Vocabulary	Word Knowledge	.70
3	4	122	DE	Level of Comprehension	Reading	.81
				Vocabulary	Word Knowledge	.84

Substantial correlations with tests of the Educational Testing Service are shown in Table 17 for our Tests of General Ability with the School and College Ability Tests and in Table 18 for our Tests of Reading with the Reading Test of the Sequential Test of Educational Progress. In both, raw scores of the Inter-American Series are correlated with converted scores of the ETS series.

Table 17
Tests of General Ability - Correlation with ETS School and College Ability Tests

(GA raw scores with SCAT converted scores. Mean of two coefficients.)

			Inter-American Tests		School and College Ability Tests			
Level	Grade	Number	Form	Subtests	Verbal	Quant	Total	Form
3	5	60, 55	CE	Verbal	.77	.60	.78	5A
				Nonverbal	.43	.49	.53	
				Numerical	.54	.72	.71	
				Total	.70	.71	.81	
4	8	49, 43	DE	Verbal	.78	.56	.78	4A
				Nonverbal	.42	.62	.60	
				Numerical	.46	.77	.68	
				Total	.68	.80	.84	
5	11	49, 46	DE	Verbal	.81	.67	.84	2A
				Nonverbal	.43	.65	.59	
				Numerical	.46	.82	.70	
				Total	.67	.86	.85	
Level 5 with longer time limits:								
5	11	55, 42	CE	Verbal	.83	.60	.82	2A
				Nonverbal	.41	.47	.48	
				Numerical	.46	.83	.70	
				Total	.70	.79	.83	

Table 18
Tests of Reading - Correlation with ETS STEP Reading Test

(Reading raw scores with STEP converted score. Mean of two coefficients.)

			Inter-American Tests		ETS STEP Reading Test	
Level	Grade	Number	Form	Subtests	r	Form
3	5	24, 22	CE	Vocabulary	.72	4A
				Speed of Comp	.55	
				Level of Comp	.73	
				Total	.75	
4	8	28, 33	CE	Vocabulary	.34	3A
				Speed of Comp	.47	
				Level of Comp	.54	
				Total	.51	
5	11	26, 24	CE	Vocabulary	.69	2A
				Speed of Comp	.63	
				Level of Comp	.80	
				Total	.78	
5	college	45, 50	DE	Vocabulary	.65	1A
				Speed of Comp	.60	
				Level of Comp	.66	
				Total	.73	

In a special study by Frankie V. S. Bentrup, the Tests of General Ability and Reading, Level 4, were administered in October, 1962, to students in Grade 8 of a large Texas junior high school. In the administration of each of the tests, Forms CE and DE were distributed alternately in an effort to select students of approximately equal ability for the two forms. Other information gathered for the study include scores on the California Mental Maturity Test, scores on the California Achievement Tests of Arithmetic and Reading, and grade-point averages. Since a large proportion of the students tested were from Spanish-speaking families, the results are of special interest because of their bearing on the possible usefulness of the tests with this special group.

The California Mental Maturity Test scores were obtained from an administration of the test at the beginning of grade 7, and the California Achievement Test scores from an administration of the test at about the middle of grade 7. The grade points are based upon grades in arithmetic, English, social studies, and science at the end of the first semester of grade 8.

Correlations with the California Mental Maturity and Achievement Tests are shown in Table 19 and with grade points in Table 22.

Table 19
Correlation of Inter-American Tests with

Level	Grade	Form	Number	Inter-American General Ability with California Mental Maturity	Correlation
4	8	CE, DE together	328	Verbal with Language	.75
				Nonverbal with Non-Language	.48
				Numerical with Non-Language	.56
				Total with Total	.71

Level	Grade	Form	Number	Inter-American Reading with California Achievement	Correlation
4	8	CE, DE together	328	Vocabulary with Vocabulary	.64
				Level of Comprehension with Comprehension	.68

The correlation of the Tests of General Ability and Tests of Reading, Level 5, Spanish Edition, with Entrance Test scores at the University of Puerto Rico are shown in Table 20. The Nonverbal score has a low correlation of .38, but the Total score on the Test of General Ability has a correlation of .65, and the Total score on the Test of Reading a correlation of .60.

Table 20
Intercorrelation of Tests of General Ability and Reading, Spanish Edition, Level 5, with Entrance Test, University of Puerto Rico

(Values in the table are means of two values, one from the group to which Form CEs was administered and one from the group to which Form DEs was administered.)

Variable	Mean	Standard Deviation	1	2	3	4	5
HG-5-CEs (n=111) and HG-5-DEs (n=106)							
1. Verbal	37	5.8	1.00	.47	.32	.72	.62
2. Nonverbal	33	6.5	.47	1.00	.41	.80	.38
3. Numerical	25	8.0	.32	.41	1.00	.80	.52
4. Total	95	15.8	.72	.80	.80	1.00	.65
5. Entrance Test	158	29.6	.62	.38	.52	.65	1.00
L-5-CEs (n=111) and L-5-DEs (n=106)			1	2	3	4	5
1. Vocabulary	35	5.9	1.00	.59	.61	.85	.53
2. Speed of Comprehension	14	4.2	.59	1.00	.63	.82	.46
3. Level of Comprehension	28	6.7	.61	.63	1.00	.90	.55
4. Total	77	14.5	.85	.82	.90	1.00	.60
5. Entrance Test	158	29.6	.53	.46	.55	.60	1.00

Table 21 lists correlations of the Tests of General Ability, Levels 1 and 2, and the Tests of Reading, Levels 2, 3, and 4, with teachers' marks or estimates of pupil progress.

Table 21
Correlation of Inter-American Tests with Teachers' Marks or Estimates of Pupil Progress, Grades 1-4

Test	Level	Grade	Form	Number	Coefficient Verbal-Numerical		Nonverbal	Total
General Ability	1	1	CE(1)	56	.45		.52	.53
	1	1	CEs(1)	111	.39		.47	.48
	2	2 and 3	CE and DE	170	.46		.46	.53
Reading					Vocabulary	Speed	Level	Total
	2	3	DEs	42	.66	.65	.50	.65
	3	4	CEs and DEs(2)	38, 40	.28	.33	.38	.36
	3	6	CEs and DEs(2)	41, 41	.50	.49	.48	.55
	4	8	CEs and DEs(2)	42, 37	.55	.60	.62	.65

(1) These correlations are based on data from a border Texas city.

(2) These coefficients are means of the coefficients for the two forms.

Correlations of the Test of General Ability, Level 1, with the Metropolitan Readiness Test are high: Form CE, .75 (n 83) and .82 (n 30); Form DE, .84 (n 50).

Coefficients showing the correlation of the Tests of General Ability and Tests of Reading, Level 4, with grade points are listed in Table 22.

Table 22
Tests of General Ability and Reading, Level 4, English Edition, Grade 8--Correlation with Grade Points
(n = 328)

Test	Grade Points				
General Ability	Arithmetic	English	Social Studies	Science	Total
Verbal	.35	.45	.29	.46	.52
Nonverbal	.34	.35	.21	.30	.40
Numerical	.48	.36	.33	.48	.56
Total	.46	.45	.32	.49	.58
Reading					
Total	.34	.41	.32	.48	.52

Table 23 lists coefficients showing the correlation of the test scores of freshmen entering the University of Texas and the grade points earned by the students in the first semester. Grade points were found for courses in mathematics and the natural sciences (astronomy, biology, chemistry, geology, mathematics, and physics), in the social sciences (anthropology, economics, history, philosophy, psychology, and sociology), and in languages (English, French, German, Greek, Latin, Russian, and Spanish). The total grade points include these and all other courses which were completed with an assigned grade.

Table 23
Correlation of College Board Scholastic Aptitude Tests and Inter-American Tests of General Ability and Reading, Level 5, Form CE, with Grade Points

	Scholastic Aptitude		General Ability				Reading			
	Verbal	Mathematics	Verbal	Nonv	Num	Total	Vocab	Speed	Level	Total
Group 1 n = 701 Natural Sciences and Mathematics	.33	.49	.38	.33	.47	.51	.34	.24	.32	.34
Total Grade Points	.44	.45	.46	.28	.42	.50	.40	.35	.43	.46
Group 2 n = 402 Social Sciences	.51	.35	.42	.16	.22	.33	.42	.37	.44	.47
Total Grade Points	.51	.46	.48	.26	.38	.47	.42	.38	.45	.48
Group 3 n = 664 Languages	.45	.30	.44	.20	.29	.39	.39	.39	.43	.46
Total Grade Points	.44	.44	.45	.27	.41	.49	.41	.35	.43	.46

Other correlations which bear upon the validity of the Inter-American tests will be found in some of the special studies to be reported later in this chapter.

NORMS

The norms of a test represent the performance of a group or groups with which comparisons can be made to lend meaning to scores obtained by other administrations of the test. In reality norms often represent an idealized performance, a series of values smoothed to eliminate irregularities and approximated, especially at the extremes, when sufficient data are lacking. The distributions of scores presented in this report present only a beginning toward the norms needed for interpretation of the scores in the unusually great variety of situations for which the tests are designed.

In this section we are presenting percentile distributions of scores for all of the tests. Many of the groups represented in the tables were formed, in part at least, for purposes other than norms, and the sampling is not such as to make them representative of a definable region. Another factor to be considered is that we have used the first test in case both forms had been administered to the same group. This is an important factor in test interpretation when groups differ in the test-taking ability which they have developed. The effect of practice differs widely among individuals and among groups.

To supplement percentile norms and to meet the needs of persons who prefer to think in terms of quotients, we suggest that raw scores be transformed into a scale of Coefficients of Learning, Tentative, (CLT) with a mean of 100 and a standard deviation of 15 for either a school grade or an age group. In local situations where statistical assistance is lacking, similar results can be obtained by using a median of 100 and a quartile deviation of 10 for the conversion of scores.

Tests of General Ability

Percentile equivalents for the Tests of General Ability, Levels 1 and 2, are listed in Tables 24, 26, 27, and 28. The relation of the full-length test to the abbreviated test at level 1 is shown in Table 25.

Form CE and Form DE scores have been combined to yield the percentiles of Table 24. In the V-N subtest Form DE seems to be about one point easier than Form CE between scores 8 and 26; in the Total score Form DE about one point easier than Form CE at scores 12 and 44 and about 2 points easier between 16 and 32.

Table 24
Results of Tests of General Ability, Level 1, English Edition

A. GA-1-CE and GA-1-DE
Grade 1, September and October
(6 districts and 2 private schools. n=530)

Score	Verbal-Numerical	Non-verbal	Score	Total
	Percentile			Percentile
38	98	99	76	99
36	93	96	72	97
34	85	90	68	90
32	70	80	64	78
30	54	64	60	62
28	40	50	56	47
26	30	40	52	33
24	21	31	48	23
22	13	24	44	18
20	10	19	40	13
18	7	15	36	9
16	5	11	32	6
14	3	8	28	4
12	1	5	24	2
10		3	20	1
8		2		
6		1		
4				

B. GA-1-CE and GA-1-DE
Kindergartens, Second Semester
(3 districts and 1 private school. n=480)

Score	Verbal-Numerical	Non-verbal	Score	Total
	Percentile			Percentile
38	99	99	76	
36	94	98	72	99
34	84	93	68	93
32	69	85	64	82
30	50	73	60	68
28	33	61	56	51
26	19	49	52	36
24	11	39	48	23
22	6	30	44	14
20	4	22	40	9
18	2	17	36	6
16	1	12	32	4
14		8	28	2
12		6	24	1
10		4		
8		3		
6		2		
4		1		

C. GA-1-CE and GA-1-DE
Preschool (Non-kindergarten)
Spring Tests, One District
n = 356

38	99			
36	98			
34	94	98	68	99
32	89	97	64	96
30	82	94	60	93
28	72	90	56	88
26	62	85	52	80
24	53	80	48	72
22	45	75	44	64
20	35	69	40	56
18	25	63	36	48
16	17	58	32	40
14	11	52	28	32
12	6	45	24	21
10	3	38	20	12
8	1	30	16	6
6		22	12	2
4		14	8	
2		5		

D. GA-1-CE-A and GA-1-DE-A
Kindergarten
Spring Tests, Three Districts
n = 416

30	97	99	58	99+
28	90	97	56	97
26	83	90	52	91
24	72	77	48	80
22	58	62	44	61
20	40	44	40	40
18	24	29	36	22
16	15	17	32	12
14	7	10	28	5
12	3	6	24	3
10	1	3	20	1
8		2		
6		1		
4				

Table 25
General Ability, Level 1, Relation of Abbreviated Test to Full-Length Test

A. Correlations

Grade	Tests* Correlated	Number	Score	r	Mean CE-A	Mean DE	Standard Deviation CE-A	Standard Deviation DE
K	CE-A - DE	138	V-N	.53	20	30	4.0	4.9
			Nv	.70	20	28	4.9	6.0
			Total	.79	40	58	7.7	9.5
K	DE - CE-A	56	V-N	.72	21	30	4.5	4.2
			Nv	.64	22	25	4.7	7.1
			Total	.75	43	55	7.9	9.9
1	CEs-A - DEs	55	V-N	.70	21	31	3.3	3.7
			Nv	.52	21	25	4.7	6.4
			Total	.69	42	56	6.8	8.5
1	DEs - CEs-A	57	V-N	.66	20	31	4.4	4.2
			Nv	.57	18	24	5.1	6.1
			Total	.73	38	54	8.4	8.8

*Listed in order administered

B. Equivalent Scores

Part Score CE-A or CEs-A	Part Score DE or DEs V-N	Part Score DE or DEs Nv	Total Score CE-A or CEs-A	Total Score DE or DEs
30		37	60	75
28	38	35	56	73
26	36	33	52	69
24	34	30	48	64
22	32	27	44	60
20	30	25	40	56
18	28	23	36	51
16	26	20	32	46
14	24	17	28	41
12	22	15	24	37
10	20	12	20	33
8	18	10		
6	16			

The equated scores are based on the administration of GA-1-CE-A and GA-1-DE to two groups of 56 and 138 kindergarten children, and of HG-1-CEs-A and HG-1-DEs to two groups of 55 and 57 first-grade children. The values are approximations from smoothed distributions, and are extrapolated when necessary.

Table 26
Results of Tests of General Ability, Level 2, English Edition
(Grade 2: n=97 and 108; grade 3: n=119 and 143; five districts)

Verbal-Numerical			Nonverbal				Total Score			
Score	Percentiles		Score		Percentiles		Score		Percentiles	
CE and DE	Gr 2	Gr 3	CE	DE	Gr 2	Gr 3	CE	DE	Gr 2	Gr 3
52		99	38	39		99	84	85		98
50		98	36	37		97	80	82		95
48		96	34	35	98	91	76	78		87
46		89	32	33	91	78	72	73		69
44		81	30	31	81	62	68	69	94	51
42		70	28	29	67	47	64	64	80	31
40	98	55	26	27	52	30	60	60	62	18
38	93	41	24	24	37	20	56	56	44	9
36	83	26	22	22	23	12	52	51	30	3
34	70	14	20	20	14	6	48	47	20	1
32	57	6	18	18	8	2	44	43	11	
30	45	3	16	16	4	1	40	39	5	
28	34	2	14	14	2		36	35	2	
26	24	1	12	12	1					
24	15									
22	10									
20	5									
18	2									
16	1									

Table 27
Results of Tests of General Ability, Level 1, Spanish Edition
Puerto Rico Public Schools, Grade 1, Fall Tests

Verbal-Numerical			Nonverbal		Total		
Score		Percentile	Score	Percentile	Score		Percentile
CEs	DEs		CEs and DEs		CEs	DEs	
36	36	99	32	99	64	64	98
34	34	97	30	97	60	60	95
32	32	93	28	94	56	56	90
30	30	86	26	90	52	52	85
28	28	79	24	86	48	48	78
26	27	70	22	81	44	45	70
24	25	60	20	76	40	41	62
22	23	49	18	70	36	37	54
20	21	37	16	63	32	34	45
18	19	29	14	56	28	30	34
16	17	21	12	48	24	26	25
14	15	13	10	38	20	22	17
12	13	9	8	30	16	18	10
10	11	5	6	22	12	13	4
8	9	2	4	16			
6	6	1	2	10			

CEs n = 205; DEs n = 201

Table 28

Results of Tests of General Ability, Level 2, Spanish Edition
(Grade 2: n = 107 and 99; Grade 3: n = 105 and 104; Grade 4: n = 141 DEs only)

Verbal-Numerical				Nonverbal				
Score		Percentile		Score			Percentile	
CEs and DEs	Gr 2	Gr 3	Gr 4	CEs	DEs	Gr 2	Gr 3	Gr 4
56			99	36	37			99
54			96	34	35			98
52			92	32	33		99	96
50			86	30	31		98	92
48		99	79	28	29	99	95	86
46		97	66	26	27	95	86	70
44		93	49	24	24	88	72	50
42		89	36	22	22	79	57	34
40		82	26	20	20	68	43	22
38	98	74	16	18	18	55	32	13
36	95	64	9	16	16	38	21	7
34	92	49	5	14	14	25	11	3
32	87	36	3	12	12	15	6	2
30	78	23	1	10	10	10	3	1
28	68	15		8	8	6	1	
26	55	9		6	6	4		
24	42	6		4	4	2		
22	30	4		2	2	1		
20	19	2						
18	10	1						
16	6							
14	3							
12	1							

Total

CEs	DEs	Gr 2	Gr 3	Gr 4
88	89			99
84	85			96
80	82			93
76	78		98	88
72	73		97	72
68	69		92	54
64	64	99	83	35
60	60	97	70	20
56	56	91	54	11
52	51	80	37	5
48	47	68	21	1
44	43	52	12	
40	39	37	7	
36	35	25	4	
32	32	15	2	
28	28	9		
24	24	4		
20	20	2		

Tentative (fall) norms for the Tests of General Ability, Levels 3, 4, and 5, English edition, based on equating the Inter-American Tests with the School and College Ability Tests of the Educational Testing Service are presented in Tables 29-31. Percentile values for the Tests of General Ability, Levels 3, 4, and 5, Spanish edition, based on the administration of the tests in the public schools of Puerto Rico, are given in Tables 32-34.

Table 29
Tests of General Ability, Level 3, English Edition--Tentative Norms
(Estimated from "equivalent" scores of School and College Ability Tests)

n = 216

Verbal

Score		Percentile		
CE	DE	Gr 4	Gr 5	Gr 6
48	47	99+	98	94
46	44	98	91	82
44	42	97	85	70
42	39	95	79	62
40	37	93	73	56
38	35	90	68	50
36	33	87	61	44
34	31	83	54	38
32	29	79	49	34
30	28	74	44	29
28	27	68	38	25
26	25	62	32	21
24	24	55	26	17
22	22	48	21	14
20	20	41	17	11
18	18	35	13	9
16	16	29	10	6
14	14	24	8	4
12	12	19	6	3
10	10	14	4	2
8	8	9	2	
6	6	4	1	

Nonverbal

Score		Percentile		
CE	DE	Gr 4	Gr 5	Gr 6
48	48			99
46	46			97
44	44		99	89
42	41		96	72
40	38		90	55
38	36		83	46
36	34	99	76	38
34	32	97	69	30
32	30	95	62	26
30	29	93	55	22
28	27	90	48	18
26	26	86	41	15
24	24	81	33	12
22	22	71	25	10
20	20	60	18	7
18	18	49	12	5
16	16	37	9	3
14	14	25	6	1
12	12	17	4	
10	10	7	2	

Numerical

Score		Percentile		
CE	DE	Gr 4	Gr 5	Gr 6
44	44			99
42	42		99+	96
40	40		99	88
38	38		97	74
36	36	99+	92	59
34	34	99+	85	50
32	32	99	79	42
30	30	98	73	36
28	28	97	67	30
26	26	95	60	25
24	24	92	52	20
22	22	87	42	17
20	20	80	33	13
18	18	72	25	10
16	16	64	20	8
14	14	55	15	6
12	12	45	12	4
10	10	35	9	3
8	8	25	6	2
6	6	17	4	1
4	4	11	2	

Total

Score		Percentile		
CE	DE	Gr 4	Gr 5	Gr 6
136	134			98
132	129		99+	94
128	125		98	87
124	121		96	76
120	117	99+	92	66
116	112	99+	88	59
112	108	99	83	53
108	104	98	79	48
104	100	97	73	43
100	96	95	67	39
96	93	93	61	34
92	90	90	53	30
88	86	86	47	25
84	83	81	41	21
80	79	76	37	19
76	76	71	33	16
72	72	65	29	14
68	68	60	26	12
64	64	55	22	10
60	60	50	18	9
56	56	45	15	8
52	52	40	12	6
48	48	35	10	5
44	44	31	8	4
40	40	26	7	3
36	36	22	5	2
32	32	17	4	2
28	28	13	3	1
24	24	9	2	
20	20	3		

Table 30

Tests of General Ability, Level 4, English Edition--Tentative Norms (Estimated from "equivalent" scores of School and College Ability Tests)

n = 187

Verbal

Score		Percentile		
CE	DE	Gr 7	Gr 8	Gr 9
48	48		99	96
46	46		97	93
44	44	98	95	89
42	42	97	92	83
40	40	95	88	76
38	38	92	82	69
36	36	88	76	61
34	34	82	70	53
32	32	75	63	46
30	30	68	55	39
28	28	61	47	31
26	26	53	36	23
24	24	43	27	17
22	22	33	20	12
20	20	25	15	9
18	18	19	10	6
16	16	14	6	4
14	14	10	2	2
12	12	7		
10	10	4		
8	8	2		

Nonverbal

Score		Percentile		
CE	DE	Gr 7	Gr 8	Gr 9
48	48		96	90
46	46	99	92	82
44	44	98	88	72
42	42	96	81	63
40	40	93	70	53
38	38	86	58	43
36	36	75	45	33
34	34	58	30	23
32	32	46	22	15
30	30	38	17	11
28	28	31	14	9
26	26	23	11	7
24	25	18	9	5
22	23	13	6	3
20	21	7	3	1
18	19	3	1	
16	17	1		

Numerical

48	48		98	94
46	47		97	93
44	45		95	91
42	44		94	88
40	42		92	83
38	40	99	89	76
36	38	97	85	69
34	36	95	78	62
32	34	93	70	55
30	32	89	62	48
28	30	83	55	41
26	28	77	47	34
24	26	68	39	27
22	24	57	30	21
20	22	46	23	15
18	20	37	17	11
16	18	29	13	9
14	16	23	10	7
12	14	18	8	5
10	11	12	5	2
8	9	8	3	
6	7	4	1	
4	4	2		

Total

148	149			98
144	145			97
140	142		99	95
136	138		98	93
132	134		97	91
128	130		96	87
124	126	99	94	81
120	122	98	91	75
116	118	97	87	69
112	114	95	81	64
108	110	92	75	58
104	106	89	69	52
100	102	85	63	46
96	98	80	57	40
92	94	74	49	34
88	90	66	42	28
84	86	59	36	23
80	82	51	31	19
76	79	45	26	16
72	75	39	21	12
68	71	32	17	8
64	67	26	12	6
60	63	20	9	4
56	60	15	7	3
52	56	10	5	1
48	52	6	3	
44	48	3	1	
40	44	1		

Table 31

Tests of General Ability, Level 5, English Edition--Tentative Norms
(Estimated from "equivalent" scores of School and College Ability Tests)

n = 171

Verbal

Score		Percentile			
CE	DE	Gr 10	Gr 11	Gr 12	Gr 13
48	48				96
46	47			99	93
44	45	99	98	97	85
42	43	98	95	94	75
40	42	96	93	91	66
38	40	93	89	84	57
36	38	90	83	77	46
34	36	86	76	70	36
32	34	81	69	63	29
30	32	76	62	56	23
28	30	69	56	50	19
26	27	60	47	40	15
24	24	51	37	31	12
22	22	44	30	24	9
20	20	38	24	20	7
18	18	32	20	16	6
16	16	26	16	13	4
14	14	20	12	10	3
12	12	15	9	7	2
10	10	10	6	4	1
8	8	5	3	1	
6	6	1			

Nonverbal

Score		Percentile			
CE	DE	Gr 10	Gr 11	Gr 12	Gr 13
46	46				96
44	44	98	98	97	90
42	42	95	94	92	79
40	40	91	88	84	68
38	38	84	79	75	56
36	36	75	68	66	44
34	34	66	58	57	34
32	32	56	48	48	25
30	30	46	40	40	19
28	28	38	32	32	14
26	26	30	25	25	11
24	24	21	17	17	8
22	22	11	9	9	5
20	20	5	1	1	2
18	18	1			

Numerical

48	48				97
46	46				95
44	44	99	99	98	93
42	42	98	97	96	89
40	40	97	96	94	84
38	38	96	94	92	79
36	36	94	92	89	74
34	34	92	89	86	69
32	32	90	87	83	64
30	31	88	84	80	60
28	29	85	79	76	55
26	27	80	72	70	48
24	25	72	65	62	40
22	23	64	57	55	31
20	21	56	49	48	25
18	19	48	41	41	20
16	17	41	34	34	16
14	15	34	27	27	13
12	13	26	21	21	10
10	11	18	14	14	7
8	9	13	9	9	5
6	6	6	4	4	2
4	4	3	2	1	

Total

144	143				99
140	139				97
136	135				95
132	131			99	91
128	128		99	97	88
124	124	99	97	95	83
120	121	98	95	93	77
116	117	96	93	89	69
112	114	94	90	86	61
108	110	92	86	82	53
104	107	89	82	78	47
100	103	86	77	74	40
96	100	82	73	70	35
92	96	78	67	64	30
88	92	72	60	56	25
84	88	66	54	50	21
80	83	59	47	43	16
76	79	53	42	37	13
72	74	48	37	32	11
68	70	43	33	28	9
64	66	38	28	24	7
60	62	34	24	21	5
56	57	28	19	17	3
52	53	24	15	13	1
48	49	19	11	10	
44	45	15	8	7	
40	41	12	5	4	
36	37	8	2	1	
32	33	5			
28	29	1			

Table 32

Results of Tests of General Ability, Level 3, Spanish Edition, Midyear

Grade 4: CEs n = 131; Grade 5: CEs n = 119; Grade 6: CEs n = 130

Verbal

Score		Percentile		
CEs	DEs	Grade 4	Grade 5	Grade 6
46	44			98
44	42			94
42	39		98	90
40	37		95	85
38	35		92	78
36	33		88	70
34	31	98	84	62
32	29	97	80	55
30	28	95	75	47
28	27	92	67	39
26	25	84	58	31
24	24	74	49	24
22	22	65	40	18
20	20	57	33	14
18	18	50	27	11
16	16	43	21	8
14	14	35	15	5
12	12	28	10	3
10	10	21	6	1
8	8	13	4	
6	6	7	2	
4	4	3	1	
2	2	1		

Nonverbal

Score		Percentile		
CEs	DEs	Grade 4	Grade 5	Grade 6
44	44			99
42	41	99		96
40	38	98	98	92
38	36	97	95	86
36	34	95	91	79
34	32	93	87	71
32	30	90	82	62
30	29	87	76	54
28	27	82	70	47
26	26	77	63	41
24	24	71	56	34
22	22	64	47	27
20	20	53	37	21
18	18	40	25	15
16	16	28	17	10
14	14	21	11	6
12	12	15	8	3
10	10	11	6	1
8	8	8	4	
6	6	6	3	
4	4	4	2	
2	2	2		

Numerical

CEs and DEs			
44			99
42			97
40			93
38			88
36		98	82
34		94	76
32	99	89	70
30	98	84	64
28	97	78	58
26	96	72	52
24	94	66	46
22	91	59	40
20	84	50	33
18	74	41	26
16	63	32	19
14	53	23	12
12	42	14	8
10	28	8	5
8	16	5	3
6	8	3	1
4	4	1	
2	1		

Total

128	125			99
124	121			96
120	117			93
116	112			90
112	108		99	87
108	104		98	84
104	100		96	80
100	96	99	93	76
96	93	98	90	69
92	90	97	86	60
88	86	96	81	52
84	83	94	76	46
80	79	92	70	41
76	76	90	63	36
72	72	87	56	31
68	68	82	49	26
64	64	76	42	21
60	60	68	35	17
56	56	59	29	13
52	52	49	23	11
48	48	40	18	9
44	44	32	13	6
40	40	26	8	4
36	36	20	5	2
32	32	15	3	1
28	28	11	2	
24	24	8	1	
20	20	5		
16	16	3		
12	12	2		

Table 33

Results of Tests of General Ability, Level 4, Spanish Edition, Spring Semester Grade 7: n = 67 and 67; Grade 8: n = 61 and 48; Grade 9: n = 67 and 66

Verbal

Score	Percentile		
CEs and DEs	Grade 7	Grade 8	Grade 9
46	99	99	98
44	97	96	95
42	95	91	90
40	92	83	84
38	89	73	78
36	86	64	73
34	83	56	67
32	80	50	61
30	75	44	55
28	69	38	49
26	63	32	43
24	56	27	37
22	49	22	28
20	43	16	20
18	36	10	13
16	28	6	9
14	21	3	5
12	15	1	2
10	9		
8	5		
6	2		

Nonverbal

Score		Percentile		
CEs	DEs	Grade 7	Grade 8	Grade 9
46	46		99	
44	44	99	98	99
42	42	97	95	97
40	40	95	91	94
38	38	93	86	88
36	36	90	80	81
34	34	86	71	74
32	32	82	59	67
30	30	78	49	60
28	28	73	41	53
26	26	68	34	47
24	25	63	28	41
22	23	58	22	34
20	21	51	17	27
18	19	42	13	21
16	17	33	10	15
14	15	22	6	10
12	12	13	3	7
10	10	7	1	4
8	8	5		2
6	6	3		
4	4	1		

Numerical

CEs	DEs			
36	38		99	
34	36	98	98	98
32	34	97	96	96
30	32	95	92	92
28	30	93	85	86
26	28	90	75	81
24	26	86	65	74
22	24	81	54	66
20	22	72	44	58
18	20	64	33	49
16	18	55	24	40
14	16	47	17	31
12	14	39	12	21
10	11	30	8	12
8	9	18	5	5
6	7	8	3	2
4	4	2	1	

The much higher scores of grade 8 than of grade 9 suggest a biased sampling or an error in test administration.

Total

120	122			99
116	118	99	99	98
112	114	98	97	96
108	110	96	94	92
104	106	94	88	87
100	102	91	80	83
96	98	89	72	79
92	94	86	65	74
88	90	84	59	70
84	86	81	53	65
80	82	79	47	59
76	79	76	41	53
72	75	72	35	47
68	71	66	29	41
64	67	59	23	36
60	63	52	17	31
56	60	46	13	26
52	56	40	10	22
48	52	34	8	17
44	48	29	6	13
40	44	23	4	8
36	39	18	2	4
32	34	12		2
28	29	7		1
24	25	4		
20	21	2		

Table 34

Results of Tests of General Ability, Level 5, Spanish Edition, Spring Semester

Grade 10: n = 63 and 61; Grade 11: n = 63 and 53; Grade 12: n = 62 and 59

Verbal					Nonverbal			
Score		Percentile			Score	Percentile		
CEs	DEs	Grade 10	Grade 11	Grade 12	CEs and DEs	Grade 10	Grade 11	Grade 12
38	40			99	44		99	
36	38		98	97	42		98	99
34	36		95	94	40	99	96	97
32	34	98	91	90	38	96	93	92
30	32	95	85	84	36	92	90	85
28	30	88	79	75	34	87	85	77
26	27	79	70	60	32	81	79	68
24	24	70	61	50	30	74	71	57
22	22	61	52	42	28	66	58	47
20	20	52	43	33	26	54	47	38
18	18	43	31	24	24	43	38	30
16	16	33	19	16	22	34	31	22
14	14	22	12	8	20	27	23	16
12	12	13	8	3	18	21	17	12
10	10	6	5	1	16	15	12	8
8	8	2	3		14	10	7	5
6	6		1		12	5	3	2
					10	2	2	
					8		1	

Numerical					Total				
					CEs	DEs			
32	32		99	99	104	107			99
30	31		98	98	100	103		99	98
28	29		97	97	96	100		97	97
26	27		96	96	92	96	99	95	94
24	25	98	95	93	88	92	98	92	91
22	23	97	92	89	84	88	97	88	86
20	21	95	87	80	80	83	93	83	79
18	19	90	78	70	76	79	87	77	71
16	17	81	68	60	72	74	81	71	62
14	15	71	58	49	68	70	75	64	54
12	13	60	43	35	64	66	69	57	45
10	11	47	28	23	60	62	62	49	37
8	9	29	16	13	56	57	53	41	30
6	6	13	5	6	52	53	44	33	22
4	4	6	1	2	48	49	33	25	15
2	2	3			44	45	25	18	10
					40	41	19	10	7
					36	37	13	6	4
					32	33	8	3	2
					28	29	4	1	1
					24	25	1		

Tests of Reading

Results of the Tests of Reading, Level 2, English edition, are presented in Tables 35-37.

One could safely infer from the results of administering the Tests of Reading, Level 2, in the second grade that the tests would be too difficult for general use in grade 1. This proved to be true in an administration of the tests in two cities as shown in Table 35. The test of Speed of Comprehension was especially frustrating. On the other hand it does offer an opportunity for the most able students to show their superior ability.

Table 35
Results of Tests of Reading, Level 2, in Grade 1

		First City				Second City	
		Form CE n = 65		Form DE n = 66		Form CE n = 16	
	Possible Score	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Level	40	12	6.2	12	6.7	11	3.9
Speed	30	5	2.9	5	3.4	6	3.3
Vocabulary	40	16	7.3	16	8.0	14	4.7
Total	110	34	15.0	33	16.7	31	9.9

Table 36
Results of Tests of Reading, Level 2, English Edition
Fall Semester, Grade 2: n = 116 and 75; Grade 3: n = 65 and 89

Vocabulary				Speed of Comprehension				Level of Comprehension			Total			
Score		Percentile		Score		Percentile		Score	Percentile		Score		Percentile	
CE	DE	Gr 2	Gr 3	CE	DE	Gr 2	Gr 3	CE and DE	Gr 2	Gr 3	CE	DE	Gr 2	Gr 3
38	39		99	28	26		93	38		97	104	103		98
36	37	99	93	26	24		90	36		93	100	99		95
34	35	96	80	24	22		86	34		87	96	95		93
32	33	92	67	22	21		83	32	98	79	92	91		90
30	31	88	57	20	19		77	30	97	70	88	87		86
28	29	83	47	18	17	99	71	28	95	60	84	83	99	80
26	27	78	36	16	16	98	63	26	92	48	80	80	98	73
24	25	72	26	14	14	96	54	24	87	34	76	76	97	66
22	23	65	18	12	12	94	42	22	81	20	72	72	94	58
20	21	55	13	10	10	87	28	20	72	11	68	69	91	50
18	19	45	8	8	8	70	15	18	62	6	64	65	88	41
16	17	34	5	6	6	42	4	16	50	3	60	61	85	31
14	15	24	3	4	4	20	2	14	38	1	56	57	80	20
12	12	14		2	2	6	1	12	26		52	53	74	11
10	10	8	2					10	17		48	49	67	6
8	8	4						8	10		44	46	59	4
6	6	1						6	5		40	42	49	3
								4	3		36	38	38	2
								2	1		32	34	27	1
											28	30	18	
											24	26	11	
											20	22	6	
											16	18	3	
											12	14	1	

The percentiles in the above table are based on tests administered in three widely separated districts.

Table 37
Tentative Norms, Tests of Reading, Level 2, Grade 2, Spring Semester

Vocabulary Score		Percen-tile	Speed of Comprehension Score			Level of Comprehension Score		Total Score		Percen-tile
CE	DE		CE	DE	Percentile	CE and DE	Percentile	CE	DE	
38	39	98	28	26	98	38	97	100	99	99
36	37	92	26	24	97	36	94	96	95	97
34	35	81	24	22	95	34	90	92	91	94
32	33	68	22	21	93	32	84	88	87	91
30	31	55	20	19	90	30	76	84	83	87
28	29	49	18	17	84	28	67	80	80	82
26	27	35	16	16	77	26	55	76	76	74
24	25	26	14	14	68	24	44	72	72	65
22	23	19	12	12	56	22	32	68	69	56
20	21	14	10	10	41	20	23	64	65	47
18	19	9	8	8	25	18	15	60	61	38
16	17	5	6	6	12	16	9	56	57	30
14	15	3	4	4	5	14	5	52	53	23
12	12	2	2	2	1	12	3	48	49	17
10	10	1				10	2	44	46	12
8	8					8		40	42	7
						6	1	36	38	4
								32	34	2
								28	30	1

The percentiles are based on the administration of Form CE in six Texas public school districts. n = 558.

In general the spring semester testing produced a much better distribution of scores in grade 2 than the fall semester. Probably the test is too difficult for use at the beginning of grade 2 except with the more able pupils. The Speed of Comprehension subtest seems to be especially difficult.

Tentative grade norms for the Tests of Reading, Level 2, English edition, based on "equivalent" Metropolitan and Stanford Achievement Reading Test scores are listed in Table 38. The Metropolitan equivalents are based on distributions of scores from three school systems with a total of 430 cases including both Form CE and Form DE scores. The Stanford Achievement equivalents are based on 140 scores from a single school system. The norms based on the Metropolitan and Stanford scores are quite similar for Vocabulary but farther apart for Level of Comprehension.

Table 38
Tests of Reading, Level 2, English Edition--Tentative Grade Norms
(Estimated from "equivalent" Metropolitan and Stanford Reading Scores)

Grade Score	Equivalent Raw Score						
	Vocabulary			Level of Comprehension		Speed of Comprehension	Total
	Metropolitan Base		Stanford Base	Metropolitan Base	Stanford Base	Stanford Base	
	CE	DE	CE	CE and DE	CE	CE	CE
5.4			38		36	23	95
5.2			37		35	21	92
5.0			37	38	34	20	89
4.8	35	37	36	36	33	18	85
4.6	34	36	35	34	31	17	82
4.4	34	36	34	32	30	15	78
4.2	33	35	[illegible]	31	28	14	74
4.0	32	34	32	30	27	13	70
3.8	31	33	31	29	25	11	66
3.6	30	32	29	28	23	10	63
3.4	29	30	27	26	21	9	59
3.2	28	29	26	24	19	8	56
3.0	26	27	24	22	17	7	52
2.8	24	25	22	20	15	6	47
2.6	21	22	20	18	13	5	42
2.4	17	18	18	16	12	4	35
2.2	13	14		14			
2.0	9	10		12			
Possible Score	40		40	40	40	30	110

"Equivalent" scores are based on a comparison of Vocabulary and Level of Comprehension with Metropolitan Word Knowledge and Reading; a comparison of Vocabulary and Level of Comprehension with Stanford Word Meaning and Paragraph Meaning; and a comparison of Speed of Comprehension and Total score with Stanford Average.

Tentative (fall) norms for the Tests of Reading, Levels 3, 4, and 5, English edition, based on "equivalent" scores of the Reading Test of the ETS Sequential Tests of Educational Progress are recorded in Tables 39-41.

Table 39

Tests of Reading, Level 3, English Edition--Tentative Norms (Estimated from "equivalent" scores of STEP Reading Test)

n = 453

Vocabulary

Score CE	Score DE	Percentile Gr 4	Percentile Gr 5	Percentile Gr 6
42	42			98
40	40		98	95
38	38		96	92
36	36		94	88
34	34	99	92	84
32	32	97	88	80
30	31	95	85	76
28	30	94	82	71
26	29	92	79	67
24	27	91	75	63
22	25	89	70	58
20	22	85	65	53
18	19	80	57	47
16	17	74	50	40
14	15	65	42	34
12	13	55	34	26
10	11	45	25	20
8	9	35	18	15
6	6	25	12	10
4	4	13	6	5
2	2	5	2	1

Speed of Comprehension

Score CE	Score DE	Percentile Gr 4	Percentile Gr 5	Percentile Gr 6
28	28		99	98
26	26		98	95
24	24		96	92
22	22		94	87
20	20	98	91	82
18	18	96	86	76
16	17	93	80	69
14	15	90	73	61
12	13	85	65	52
10	11	75	53	43
8	9	60	40	31
6	7	43	24	19
4	5	21	10	9
2	2	2	2	1

Level of Comprehension

Score CE	Score DE	Percentile Gr 4	Percentile Gr 5	Percentile Gr 6
46	46		99	97
44	44		97	94
42	42		95	90
40	40	99	92	86
38	38	97	89	81
36	37	96	87	77
34	35	95	83	73
32	33	93	79	69
30	31	91	76	65
28	30	89	72	60
26	28	86	67	55
24	26	82	61	50
22	24	75	53	43
20	22	68	46	37
18	20	60	38	30
16	18	52	30	25
14	16	44	24	19
12	13	36	18	15
10	10	26	13	11
8	8	18	8	7
6	6	12	6	5
4	4	6	2	2

Total

Score CE	Score DE	Percentile Gr 4	Percentile Gr 5	Percentile Gr 6
112	111			99
108	107		98	96
104	103		96	93
100	99		95	90
96	96	99	93	86
92	93	98	91	83
88	89	97	89	80
84	86	96	87	77
80	82	95	84	73
76	78	94	82	70
72	74	93	79	68
68	71	92	76	65
64	68	90	73	61
60	64	88	69	58
56	60	85	64	54
52	57	81	59	49
48	53	76	53	43
44	49	70	47	37
40	45	64	40	32
36	41	55	33	26
32	36	45	25	20
28	31	35	18	15
24	27	24	12	9
20	22	12	6	5
16	18	1		

Table 40
Tests of Reading, Level 4, English Edition--Tentative Norms
(Estimated from "equivalent" scores of STEP Reading Test)

n = 419

Vocabulary

Score		Percentile		
CE	DE	Gr 7	Gr 8	Gr 9
38	38			99
36	36	99+	99	97
34	34	98	98	94
32	32	96	95	90
30	30	93	92	84
28	28	90	87	75
26	26	85	80	65
24	24	78	73	55
22	22	71	65	46
20	20	62	55	38
18	18	54	45	29
16	16	45	35	21
14	14	36	25	14
12	12	26	17	10
10	10	16	11	6
8	8	9	6	3
6	6	5	3	1
4	4	2	1	

Speed of Comprehension

Score		Percentile		
CE	DE	Gr 7	Gr 8	Gr 9
26	24			99
24	22			97
22	20	98	97	93
20	19	95	94	87
18	18	92	89	79
16	16	87	83	68
14	14	79	74	55
12	12	70	63	43
10	10	56	48	30
8	8	42	32	18
6	6	27	16	9
4	4	15	9	5
2	2	9	5	3

Level of Comprehension

CE	DE	Gr 7	Gr 8	Gr 9
44	45			99
42	43		99	98
40	41	99	99	96
38	39	98	97	93
36	37	96	95	89
34	35	94	92	84
32	33	91	89	78
30	31	88	84	70
28	29	84	79	62
26	27	78	72	55
24	25	71	64	47
22	23	65	56	40
20	21	58	48	32
18	19	50	40	25
16	17	40	30	17
14	15	30	20	12
12	13	22	13	8
10	11	15	9	5
8	8	9	5	3
6	6	5	3	1
4	4	2	1	

Total

CE	DE	Gr 7	Gr 8	Gr 9
104	104			99
100	100			97
96	96	99	99	95
92	91	98	97	93
88	87	96	95	90
84	83	95	93	86
80	79	93	90	81
76	75	90	87	75
72	71	87	84	70
68	67	84	79	63
64	63	80	74	56
60	60	74	68	50
56	57	68	60	42
52	53	61	52	35
48	49	54	45	29
44	45	48	37	24
40	41	41	31	19
36	37	34	24	14
32	33	26	18	10
28	30	18	11	6
24	26	9	5	3
20	22	4	2	

Table 41
Tests of Reading, Level 5, English Edition--Tentative Norms
(Estimated from "equivalent" scores of STEP Reading Test)

n = 237

Vocabulary

Score		Percentile			
CE	DE	Gr 10	Gr 11	Gr 12	Gr 13
44	44			99	92
42	42	99	98	97	86
40	40	98	97	94	77
38	38	95	94	90	66
36	36	92	90	85	54
34	34	89	83	76	45
32	32	84	74	67	37
30	30	78	65	57	29
28	28	70	57	48	21
26	26	61	47	38	14
24	24	52	39	29	11
22	22	42	31	22	9
20	21	34	25	17	7
18	19	28	19	14	5
16	17	23	15	11	3
14	15	17	11	8	1
12	13	14	8	6	
10	11	10	6	4	
8	8	6	4	2	
6	6	4	2		
4	4	2			

Speed of Comprehension

Score		Percentile			
CE	DE	Gr 10	Gr 11	Gr 12	Gr 13
28	29				97
26	27				94
24	25		99	98	89
22	23	98	97	96	81
20	22	96	95	92	69
18	20	93	90	85	55
16	18	88	82	75	43
14	15	80	70	62	32
12	13	69	56	48	21
10	11	55	43	34	13
8	8	40	30	22	8
6	6	26	17	12	4
4	4	12	5	4	1

Level of Comprehension

46	46				98
44	44				96
42	43			99	92
40	41	99	98	97	87
38	40	98	97	94	77
36	38	96	93	90	65
34	36	93	89	84	55
32	34	89	83	75	45
30	32	85	74	66	37
28	30	78	65	56	29
26	28	70	56	47	21
24	26	62	48	38	15
22	24	52	40	29	11
20	22	42	31	22	8
18	20	32	23	15	6
16	17	22	14	10	3
14	15	13	7	6	1
12	12	6	2	2	
10	10	1			

Total

116	116				99
112	113				97
108	110				94
104	107			99	91
100	103		99	97	87
96	100	98	98	96	81
92	96	96	95	92	70
88	92	94	92	88	59
84	88	91	87	81	51
80	84	88	81	75	44
76	80	85	75	68	38
72	76	80	70	61	32
68	72	76	64	55	26
64	68	69	56	47	21
60	64	61	48	39	15
56	60	52	40	29	11
52	55	44	33	23	9
48	51	36	26	18	6
44	47	28	20	13	4
40	43	20	12	9	2
36	39	12	7	5	
32	35	6	3	2	
28	31	2	1		

Tables 42-49 list percentiles for the Tests of Reading, Levels 2-5, Spanish edition, based on results from tests in the public schools of Puerto Rico.

Table 42

Results of Tests of Reading, Level 2, Spanish Edition, Fall Semester

Grade 2, n = 270; Grade 3, n = 305; Grade 4, n = 131

Vocabulary

Score		Percentile		
CEs	DEs	Grade 2	Grade 3	Grade 4
38	39		98	95
36	37		97	81
34	35	98	95	57
32	33	96	88	36
30	31	93	78	22
28	29	90	66	16
26	27	85	53	12
24	25	79	45	9
22	23	73	38	6
20	21	67	31	3
18	19	61	26	1
16	17	55	22	
14	15	50	18	
12	12	46	15	
10	10	41	11	
8	8	35	8	
6	6	29	6	
4	4	21	4	
2	2	12	2	

Speed of Comprehension

Score		Percentile		
CEs	DEs	Grade 2	Grade 3	Grade 4
28	26		98	90
26	24		96	85
24	22		94	80
22	21		91	76
20	19	99	88	71
18	17	97	85	66
16	16	94	81	60
14	14	90	76	52
12	12	84	69	40
10	10	73	57	27
8	8	58	41	13
6	6	39	24	5
4	4	24	8	1
2	2	12	1	

Level of Comprehension

CEs and DEs			
38			94
36			89
34		99	85
32		98	79
30		95	70
28		90	59
26	99	82	48
24	98	72	37
22	93	62	25
20	87	50	15
18	80	37	8
16	69	25	5
14	58	17	2
12	47	13	1
10	37	10	
8	28	7	
6	19	4	
4	12	2	
2	7		

Total

108	107			98
104	103			94
100	99			90
96	95			86
92	91		99	82
88	87		98	76
84	83		96	69
80	80		93	61
76	76	99	90	52
72	72	98	86	42
68	69	96	80	36
64	65	94	72	28
60	61	90	63	20
56	57	86	54	15
52	53	81	45	10
48	49	75	36	5
44	46	68	28	3
40	42	61	22	2
36	38	54	17	
32	34	48	13	
28	30	41	10	
24	26	34	7	
20	22	26	5	
16	18	18	3	
12	14	12	1	
8	9	7		

The percentiles in the above table are based on Form CEs administered in grades 2 and 3 and Form DEs administered in Grade 4 of Puerto Rico public schools.

Table 43

Results of Tests of Reading, Level 2, Spanish Edition, Spring Semester
Grade 2: Form CEs, n = 97; Form DEs, n = 102

Vocabulary			Speed of Comprehension			Level of Comprehension			Total		
Score		Percentile	Score		Percentile	Score		Percentile	Score		Percentile
CEs	DEs		CEs	DEs		CEs	DEs		CEs	DEs	
38	39	99	20	19	99	30		99	80	80	99
36	37	98	18	17	97	28		97	76	76	97
34	35	95	16	16	95	26		95	72	72	94
32	33	87	14	14	92	24		89	68	69	89
30	31	75	12	12	87	22		80	64	65	83
28	29	62	10	10	76	20		68	60	61	75
26	27	48	8	8	59	18		55	56	57	65
24	25	37	6	6	39	16		41	52	53	55
22	23	29	4	4	18	14		26	48	49	44
20	21	22	2	2	4	12		16	44	46	33
18	19	16				10		10	40	42	24
16	17	11				8		4	36	38	17
14	15	7				6		2	32	34	12
12	12	5				4		1	28	30	7
10	10	4							24	26	5
8	8	3							20	22	3
6	6	2							16	18	2
4	4	1							12	14	1

In the above table the percentages from the two distributions have been combined.

Table 44

Results of Tests of Reading, Level 3, Spanish Edition, Fall Semester
Grade 4: n = 97 and 98; Grade 5 n = 99 and 102; Grade 6: n = 105 and 101

Vocabulary

Score		Percentile		
CEs	DEs	Grade 4	Grade 5	Grade 6
38	38			99
36	36			97
34	34			94
32	32		99	90
30	30		98	86
28	28		97	81
26	26	99	96	75
24	24	98	95	68
22	23	97	93	61
20	21	96	89	51
18	19	93	83	40
16	17	88	73	33
14	15	82	63	26
12	13	75	54	20
10	11	67	44	14
8	9	55	31	9
6	6	43	21	5
4	4	30	12	2
2	2	15	4	1

Speed of Comprehension

Score		Percentile		
CEs	DEs	Grade 4	Grade 5	Grade 6
24	24			99
22	22			98
20	20			97
18	18		99	94
16	17		98	90
14	15	99	97	80
12	13	97	94	68
10	11	93	89	55
8	9	87	78	40
6	7	76	62	25
4	5	57	38	11
2	2	24	10	2

Level of Comprehension

CEs and DEs			
36			99
34		99	97
32		98	95
30		97	92
28		96	88
26		95	82
24	99	93	75
22	98	91	68
20	96	87	59
18	94	83	50
16	91	77	41
14	85	68	33
12	75	58	26
10	63	45	18
8	50	31	11
6	36	18	6
4	25	8	3
2	14	2	1

Total

92	91			99
88	87			98
84	84			96
80	80			93
76	76		99	90
72	72		98	87
68	68		97	83
64	65		96	79
60	62	99	95	74
56	58	98	93	67
52	55	97	91	60
48	51	96	89	52
44	48	95	86	45
40	44	92	81	38
36	40	88	73	31
32	35	82	64	24
28	30	76	55	18
24	26	67	42	12
20	22	55	28	7
16	18	40	18	3
12	13	28	10	1
8	8	16	3	
4	4	5		

Table 45

Results of Tests of Reading, Level 3, Spanish Edition, Spring Semester

Grade 4: Form CEs, n = 102; Form DEs, n = 98; Grade 6: Form CEs, n = 91; Form DEs, n = 95

Vocabulary

Score		Percentile	
CEs	DEs	Grade 4	Grade 6
40	40		98
38	38		97
36	36		96
34	34		93
32	32		88
30	30	99	81
28	28	98	74
26	26	97	66
24	24	95	57
22	23	91	49
20	21	86	41
18	19	79	32
16	17	69	23
14	15	58	17
12	13	47	11
10	11	36	8
8	9	24	4
6	6	13	2
4	4	5	1
2	2	2	

Speed of Comprehension

Score		Percentile	
CEs	DEs	Grade 4	Grade 6
28	28		99
26	26		98
24	24		97
22	22		96
20	20		94
18	18		90
16	17	99	82
14	15	98	70
12	13	95	57
10	11	90	44
8	9	73	30
6	7	50	16
4	5	27	7
2	2	9	1

Level of Comprehension

CEs and DEs		
38		99
36		98
34		96
32		93
30		90
28	99	85
26	98	79
24	97	73
22	95	66
20	92	59
18	88	52
16	84	44
14	76	36
12	65	27
10	50	15
8	34	5
6	19	2
4	8	1
2	3	

Total

104	103		99
100	99		98
96	95		97
92	91		96
88	87		94
84	84		92
80	80		90
76	76		87
72	72		82
68	68		76
64	65	99	71
60	62	98	65
56	58	97	59
52	55	95	54
48	51	93	48
44	48	89	41
40	44	83	34
36	40	74	26
32	35	62	18
28	30	48	11
24	26	35	6
20	21	23	1
16	17	12	
12	13	5	
8	8	2	

Table 46

Results of Tests of Reading, Level 4, Spanish Edition, Early Spring Semester
Grade 7: n = 99 and 166; Grade 8: n = 83 and 91; Grade 9: n = 92 and 95

Vocabulary

Score		Percentile		
CEs	DEs	Grade 7	Grade 8	Grade 9
38	39			99
36	37			98
34	35		99	96
32	33	99	98	94
30	31	98	97	91
28	29	96	95	88
26	27	94	90	83
24	25	91	85	76
22	23	85	78	66
20	21	79	69	54
18	19	70	58	40
16	17	59	43	30
14	15	48	31	20
12	13	36	21	12
10	11	19	11	6
8	8	12	5	1
6	6	7	2	
4	4	3		

Speed of Comprehension

Score		Percentile		
CEs	DEs	Grade 7	Grade 8	Grade 9
26	24			99
24	22		99	98
22	20	99	97	97
20	19	98	95	95
18	17	96	92	90
16	15	93	87	83
14	13	87	79	73
12	11	78	68	60
10	9	66	54	43
8	8	54	39	28
6	6	31	20	14
4	4	16	8	3
2	2	2	1	1

Level of Comprehension

CEs and DEs			
34			99
32		99	98
30		98	95
28	99	96	92
26	98	93	89
24	94	87	84
22	89	79	77
20	83	71	69
18	75	62	55
16	63	52	42
14	49	41	30
12	36	30	21
10	24	16	11
8	14	8	4
6	6	3	2
4	2		
2	1		

Total

92	91			99
88	87			98
84	83			97
80	79		99	95
76	75	99	97	93
72	71	98	94	91
68	67	96	91	88
64	63	94	87	83
60	59	91	83	76
56	55	87	79	69
52	51	82	72	60
48	48	77	64	50
44	44	68	55	39
40	40	58	44	31
36	36	48	32	22
32	32	38	22	14
28	28	28	14	8
24	24	18	8	4
20	20	9	3	1
16	16	4		
12	12	2		

Table 47
Results of Tests of Reading, Level 4, Spanish Edition,
Late Spring Semester, Grade 8
(CEs, n=96, DEs, n=102)

Vocabulary Score		Percentile
CEs	DEs	
36	37	99
34	35	98
32	33	93
30	31	88
28	29	81
26	27	71
24	25	60
22	23	48
20	21	36
18	19	28
16	17	22
14	15	16
12	13	10
10	11	5
8	8	1

Speed of Comprehension Score		Percentile
CEs	DEs	
28	26	99
26	24	98
24	22	95
22	20	91
20	19	87
18	17	79
16	15	63
14	13	49
12	11	35
10	9	24
8	8	16
6	6	8
4	4	3
2	2	1

Level of Comprehension Score	Percentile
CEs and DEs	
34	99
32	96
30	93
28	89
26	84
24	77
22	66
20	53
18	41
16	30
14	20
12	11
10	6
8	3
6	1

Total Score		Percentile
CEs	DEs	
88	87	98
84	83	95
80	79	91
76	75	87
72	71	82
68	67	77
64	63	69
60	59	60
56	55	49
52	51	38
48	48	30
44	44	25
40	40	20
36	36	15
32	32	10
28	28	5
24	24	1

Table 48

Results of Tests of Reading, Level 5, Spanish Edition, Fall Semester

Grade 10: n = 104 and 111; Grade 11: n = 104 and 112; Grade 12: n = 101 and 108

Vocabulary					Speed of Comprehension				
Score		Percentile			Score		Percentile		
CEs	DEs	Grade 10	Grade 11	Grade 12	CEs	DEs	Grade 10	Grade 11	Grade 12
40	40			99	26	24		99	99
38	38			98	24	22		98	97
36	36		99	96	22	20	98	94	92
34	34		97	94	20	18	96	90	85
32	32	99	96	91	18	16	92	83	78
30	30	97	91	85	16	14	86	75	70
28	28	92	83	75	14	12	79	67	61
26	26	86	74	64	12	10	70	57	48
24	24	77	63	54	10	9	56	45	36
22	22	68	51	42	8	7	41	27	23
20	21	59	40	33	6	6	26	15	12
18	19	50	30	23	4	4	9	4	5
16	17	35	21	14	2	2		1	1
14	15	21	13	6					
12	13	12	6	2					
10	11	5	3						
8	8		1						

Level of Comprehension					Total				
34	36			99	88	90			98
32	34			97	84	85		99	96
30	32		99	94	80	80	99	98	92
28	30	99	97	92	76	75	98	94	88
26	28	96	93	87	72	71	96	89	82
24	26	93	88	78	68	67	93	84	76
22	24	89	80	69	64	64	90	77	69
20	22	84	69	60	60	60	85	70	63
18	20	74	57	50	56	56	79	63	55
16	17	57	44	39	52	52	73	56	47
14	15	39	27	26	48	48	64	48	38
12	12	21	13	14	44	45	54	38	29
10	10	10	6	7	40	41	44	27	21
8	8	5	3	3	36	37	30	16	11
6	6	2	1	1	32	33	17	9	7
					28	29	9	4	3
					24	25	4	1	1
					20	21	1		

Table 49
Results of Tests of Reading, Level 5, Spanish Edition,
Spring Semester, Grade 10
(CEs, n=103, DEs, n=100)

Vocabulary		
Score		Percentile
CEs	DEs	
42	42	99
40	40	98
38	38	96
36	36	94
34	34	90
32	32	85
30	30	77
28	28	67
26	26	57
24	24	46
22	22	35
20	21	28
18	19	20
16	17	13
14	15	7
12	13	3
10	11	1

Speed of Comprehension		
Score		Percentile
CEs	DEs	
26	24	99
24	22	97
22	20	95
20	18	91
18	16	85
16	14	75
14	12	65
12	10	49
10	9	32
8	7	17
6	6	8
4	4	1

Level of Comprehension		
Score		Percentile
CEs	DEs	
34	36	98
32	34	96
30	32	93
28	30	89
26	28	85
24	26	78
22	24	69
20	22	57
18	20	45
16	17	31
14	15	16
12	12	7
10	10	3
8	8	1

Total		
Score		Percentile
CEs	DEs	
100	101	99
96	98	98
92	94	97
88	90	96
84	85	94
80	80	91
76	75	86
72	71	80
68	67	74
64	64	67
60	60	60
56	56	51
52	52	41
48	48	32
44	45	23
40	41	15
36	37	8
32	33	4
28	29	2

Inter-American Tests equated with Project Talent Tests

As stated in the Procedure, the Tests of General Ability, Level 5, Form CE, and the Tests of Reading, Level 5, Form CE, were calibrated with selected Project Talent Tests. The four tests selected for comparison were Reading Comprehension (R-250), "designed to measure a student's ability to comprehend written materials"; Arithmetic Computation (F410), "designed to measure a student's speed and accuracy in computation...highly speeded"; Arithmetic Reasoning (R-311), "designed to measure a student's ability to do the types of reasoning required in solving arithmetic problems"; and Abstract Reasoning (R-290), "designed to measure ability for inductive reasoning by using diagrams." The calibration was based on tests of 454 students in grades 9 to 12 of three schools. "The obtained sample gives evidence of being typical of high-school students in the United States although due to its comparatively small size, the range is somewhat restricted."

Correlation matrices of 24 variables were constructed for grade and sex, for grade with sexes combined, by sex with grades combined, and with all cases combined. Finding "no important sex differences" and "only minor" grade differences, and considering the small number of cases in the lesser groups, the staff combined all cases to develop the conversion tables. Table 50 is the correlation matrix for the 454 students who took the tests, and Table 51 lists the correlations between the Project Talent Tests and the Inter-American Tests with which they were equated.

> The equating was done by the equi-percentile method, considering scores on a pair of tests equivalent when they have the same cumulative frequency. The calculated equivalent scores were plotted, and a smooth curve was drawn to eliminate small erratic variations due to the sample of students selected. The Talent test score was read off these graphs for each I-A score.

Tentative (Spring) norms based on the tables of equivalent scores between the Inter-American Tests and the Project Talent Tests are recorded in Tables 52-57. At times because of the greater number of items in an Inter-American Test than in the Project Talent Test with which it is compared, a given Project Talent score and its corresponding percentile are paralleled by a range of Inter-American scores. Thus in grade 12 a PT Reading Comprehension score of 47 and the corresponding percentile 98 are "equivalent" to I-A Total Reading Scores of 106 to 112. In cases such as this we have approximated a percentile for an I-A score on the assumption that the PT percentile of the original table is at the midpoint of the range of corresponding scores.

Table 50

Intercorrelations of Inter-American Tests and Project Talent Tests - All Students

Code#	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Grade*		-020	227	146	157	131	119	212	332	190	201	268	205
2	Sex**	-020		-068	-060	125	-044	112	-030	-028	-116	-128	-095	-100
3	R250 Rdg. Compr.	227	-068		486	673	483	552	-776	820	738	802	862	810
4	F410 Arith. Comp.	146	-060	486		413	848	381	900	403	378	436	445	399
5	R311 Math I	157	135	673	413		481	523	658	674	601	644	700	628
6	F410 + R311	131	-044	483	848	481		361	830	419	381	453	458	434
7	R290 Abst. Reas.	119	112	552	381	523	361		595	517	421	484	521	487
8	4 Talent Tests	212	-030	776	900	658	830	595		662	594	671	705	650
9	Vocabulary	332	-028	820	403	674	419	517	662		744	790	935	783
10	Speed	190	-116	738	378	601	381	421	594	744		739	881	723
11	Level	201	-128	802	436	644	453	484	671	790	739		927	751
12	Total Reading	268	-095	862	445	700	458	521	705	935	881	927		824
13	Gen. Abil. I	205	-100	810	399	628	434	487	650	783	723	751	824	
14	Gen. Abil. II	108	018	613	356	563	328	648	553	578	470	578	597	552
15	Gen. Abil. III	044	-082	526	550	595	527	389	641	520	515	571	585	510
16	G. A. I+II+III	141	-070	788	543	730	535	617	757	761	694	771	814	828
17	Gen. Abil. IV	146	-072	774	434	672	446	611	674	785	699	781	828	762
18	Gen. Abil. V	080	077	425	316	423	274	493	446	363	339	380	392	352
19	Gen. Abil. VI	103	148	597	443	666	442	527	607	577	538	576	617	582
20	G. A. IV+V+VI	134	063	735	487	723	478	657	705	710	648	713	756	699
21	Verbal I+IV	186	-091	843	444	693	469	587	706	835	757	816	880	936
22	Nonverbal II+V	112	048	608	385	570	346	664	578	555	472	560	580	533
23	Numerical III+VI	080	030	618	551	695	537	502	691	604	581	633	663	601
24	Total Gen. Abil.	137	-011	794	543	761	533	660	766	769	698	773	818	798

Code#	Variable	14	15	16	17	18	19	20	21	22	23	24	M	σ
1	Grade	108	044	141	146	080	103	134	186	112	080	137	2.32	1.10
2	Sex	018	-082	-070	-072	077	148	063	-091	048	030	-011	0.51	0.50
3	R250 Rdg. Compr.	613	526	788	774	425	597	735	843	608	618	794	27.80	10.26
4	F410 Arith. Comp.	356	550	543	434	316	443	487	444	385	551	543	25.61	21.70
5	R311 Math I	563	595	730	672	423	666	723	693	570	695	761	8.33	3.60
6	F410 + R311	328	547	535	446	274	442	478	469	346	537	533	33.53	28.06
7	R290 Abst. Reas.	648	389	617	611	493	527	657	587	664	502	660	8.26	3.09
8	4 Talent Tests	553	641	757	674	446	607	705	706	578	691	766	70.22	32.00
9	Vocabulary	578	520	761	785	363	577	710	835	555	604	769	24.15	7.86
10	Speed	470	515	694	699	339	538	648	757	472	581	698	12.44	5.32
11	Level	578	571	771	781	380	576	713	816	560	633	773	21.87	7.29
12	Total Reading	597	585	814	828	392	617	756	880	580	663	818	58.44	18.82
13	Gen. Abil. I	552	510	828	762	352	582	699	936	533	601	798	15.69	4.62
14	Gen. Abil. II		421	789	656	529	604	723	644	900	561	786	15.43	4.82
15	Gen. Abil. III	421		820	538	297	638	612	558	417	914	750	12.73	5.79
16	G. A. I+II+III	789	820		791	478	753	830	862	746	870	955	43.82	12.41
17	Gen. Abil. IV	656	538	791		461	634	858	941	651	644	858	10.85	4.83
18	Gen. Abil. V	529	297	478	461		475	738	434	843	421	625	18.85	3.81
19	Gen. Abil. VI	604	638	753	634	475		876	648	628	895	844	13.04	5.25
20	G. A. IV+V+VI	723	612	830	858	738	876		831	835	815	948	42.75	11.56
21	Verbal I+IV	644	558	862	941	434	648	831		632	664	882	26.54	8.87
22	Nonverbal II+V	900	417	746	651	843	628	835	632		572	818	34.26	7.60
23	Numerical III+VI	561	914	870	644	421	895	815	664	572		878	25.77	9.99
24	Total Gen. Abil.	786	750	955	858	625	844	948	882	818	878		86.68	23.11

*4 = 12, 3 = 11, 2 = 10, 1 = 9.

**1 = boys, 0 = girls.

Table 51
Correlations of Inter-American Tests and Equated Project Talent Tests

TALENT Test	I-A Test	Grade 9	Grade 10	Grade 11	Grade 12	All Cases	Boys Comb.	Girls Comb.
Reading Comp.	Reading Total	.839	.883	.857	.845	.862	.883	.835
Reading Comp.	Reading Level	.772	.827	.796	.800	.802	.831	.765
Reading Comp.	Gen.Abil.Verbal	.792	.854	.877	.832	.843	.852	.831
Reading Comp.	Gen. Abil. Total	.720	.829	.828	.804	.794	.793	.799
Total of 4	Gen. Abil. Total	.699	.789	.822	.796	.766	.774	.757
Total of 4	Reading Total	.601	.692	.789	.737	.705	.717	.692
Arith.Comp.+ Reas.	Gen. Abil. Numerical	.543	.582	.502	.648	.537	.514	.588
Abstract Reas.	Gen.Abil. Nonverbal	.680	.745	.611	.586	.664	.615	.724
	Number	138	124	104	89	455	234	221

Table 52
Tentative Percentile Norms, Inter-American Tests of General Ability, Level 5, Form CE, Verbal Subtest, Based on Project Talent Reading Comprehension Test

I-A Gen. Abil. Verbal	Talent Read. Comp.	Percentiles			
		Grade 9	Grade 10	Grade 11	Grade 12
48	48				99
46	47		99	99	97
44	46	99	98	97	93
42	44	97	95	91	87
40	43	95	93	87	81
38	41	91	88	80	73
36	39	87	82	73	65
34	37	83	77	67	59
32	35	78	71	59	51
30	33	73	65	53	45
28	31	68	59	47	39
26	28	60	49	37	31
24	25	51	39	29	23
22	23	45	34	24	19
20	20	36	26	19	13
18	18	29	21	15	10
16	16	23	17	11	8
14	13	15	11	7	4
12	11	10	7	4	2
10	9	6	4	3	
8	7	3	2		1
6	5		1	1	
4	3	1			

Table 53

Tentative Percentile Norms, Inter-American Tests of General Ability, Level 5, Form CE, Nonverbal Subtest, Based on Project Talent Abstract Reasoning Test

I-A Gen. Abil. Nonverbal	Talent Abstract Reasoning	Percentiles Grade 9	Grade 10	Grade 11	Grade 12
48	14	99	99	99	98
46	14	98	96	96	95
44	12	93	91	90	86
42	12	87	83	81	76
40	11	79	74	70	65
38	10	67	61	56	53
36	9	55	50	44	39
34	8	46	41	33	30
32	7	38	33	26	23
30	6	31	25	20	17
28	6	24	19	15	12
26	5	18	14	10	9
24	4	13	10	7	6
22	3	10	7	5	4
20	3	7	5	3	3
18	2	5	3	2	2
16	2	3	2		
14	1	2	1	1	1
12	1	1			

Table 54

Tentative Percentile Norms, Inter-American Tests of General Ability, Level 5, Form CE, Numerical Subtest, Based on Project Talent Tests of Arithmetic Reasoning and Arithmetic Computation

I-A Gen. Abil. Numerical	Talent Arith. Reas. +Arith. Comp.	Percentiles Grade 9	Grade 10	Grade 11	Grade 12
50	82				99
48	73			99	98
46	67	99	99	97	95
44	63	98	97	94	90
42	60	97	95	90	85
40	57	94	92	86	79
38	55	92	89	82	75
36	52	88	84	76	68
34	50	84	80	71	63
32	48	80	76	66	57
30	45	74	69	59	50
28	43	69	63	54	45
26	40	61	55	46	38
24	36	51	45	37	29
22	33	43	38	31	24
20	29	35	29	24	19
18	24	27	22	17	13
16	19	20	16	13	10
14	11	13	11	8	6
12	2	9	7	5	4
10	-13	6	4	3	2

Table 55
Tentative Percentile Norms, Inter-American Tests of General Ability, Level 5, Form CE, Total Score, Based on Project Talent Reading Comprehension and the Four Combined Project Talent Tests*

I-A Gen. Abil.	Talent Read. Comp. 1	Total of 4 Tests 2	Percentiles Grade 9 1	2	Grade 10 1	2	Grade 11 1	2	Grade 12 1	2
144	48	131								99
140	47	128					99	99	99	98
136	47	125			99		98	98	97	97
132	46	121	99		98	99	97	97	96	95
128	45	118	98	99	97	98	95	96	93	92
124	44	114	97	98	96	97	92	93	89	88
120	43	110	95	97	93	95	88	89	83	83
116	42	106	93	94	90	92	82	84	77	77
112	40	102	89	92	85	88	77	79	70	70
108	38	98	86	89	80	83	71	73	63	64
104	37	94	83	85	76	78	65	67	57	58
100	35	89	78	79	70	71	58	59	51	50
96	33	85	72	73	64	65	52	53	45	43
92	31	80	67	66	58	57	46	46	39	37
88	29	76	62	61	51	51	39	41	33	31
84	26	72	55	55	44	45	32	35	27	27
80	24	67	49	47	37	38	27	29	22	23
76	22	62	43	41	32	32	23	24	18	18
72	21	58	38	35	28	27	20	21	15	15
68	19	53	33	30	24	22	17	16	12	12
64	17	48	27	25	20	18	14	13	9	10
60	16	41	22	19	17	13	11	10	7	7
56	14	33	18	14	13	10	8	7	5	5
52	13	23	14	10	10	7	6	4	4	3
48	11	12	11	7	8	5	4	3	3	2
44	10	- 1	8	5	6	3	3	2	2	1
40	9	-15	5	3	4	2		1		
36	8	-32	3	2	3	1	2		1	
32	6		2		2		1			
28	5				1					
24	4		1							

*Reading Comprehension, Arithmetic Reasoning, Arithmetic Computation, and Abstract Reasoning. Column 1 in each grade lists the percentiles derived from Project Talent Reading Comprehension, column 2 from the four combined Project Talent scores.

Table 56
Tentative Percentile Norms, Inter-American Tests of Reading, Level 5, Form CE, Level of Comprehension Subtest, Based on Project Talent Reading Comprehension Test

I-A Read. Level	Talent Read. Comp.	Percentiles Grade 9	 Grade 10	 Grade 11	 Grade 12
44	47				99
42	47		99	99	97
40	46	99		98	96
38	46		98	96	94
36	45	98	97	93	91
34	44	96	95	90	86
32	42	93	90	83	78
30	40	89	85	77	69
28	38	85	79	70	62
26	35	78	71	59	51
24	32	71	62	50	42
22	29	63	52	40	33
20	26	54	42	32	25
18	22	42	31	22	17
16	19	33	24	17	12
14	16	23	17	11	8
12	13	15	11	7	4
10	9	6	4	3	1
8	6	2	1	1	
6	3	1			

Table 57

Tentative Percentile Norms, Inter-American Tests of Reading, Level 5, Form CE, Total Score, Based on Project Talent Reading Comprehension and the Four Combined Project Talent Tests*

I-A Read. Total	Talent Read Comp. 1	Talent Total of 4 Tests 2	Percentiles Grade 9 1	Percentiles Grade 9 2	Percentiles Grade 10 1	Percentiles Grade 10 2	Percentiles Grade 11 1	Percentiles Grade 11 2	Percentiles Grade 12 1	Percentiles Grade 12 2
116	48	134								99
112	47	130							99	98
108	47	127			99		99	99	98	97
104	46	123	99		98	99	97	98	96	95
100	45	119	98	99	97	98	95	96	93	93
96	45	116	97	98	96	97	93	94	90	90
92	44	112	96	97	95	96	90	91	86	85
88	43	108	95	96	92	93	86	87	82	80
84	42	104	92	93	89	90	82	82	76	74
80	40	101	89	91	85	87	77	77	70	69
76	38	97	86	88	81	82	72	71	63	63
72	37	93	82	84	76	77	65	65	57	57
68	35	89	77	79	70	71	58	59	50	50
64	32	84	71	72	62	63	50	52	42	42
60	30	79	64	65	54	56	42	44	35	35
56	27	73	58	56	46	47	35	36	28	28
52	25	67	51	47	39	38	29	29	23	23
48	22	61	43	39	32	30	23	23	18	17
44	20	54	35	31	26	23	18	17	13	13
40	17	46	27	23	20	17	13	12	9	9
36	15	35	20	15	14	11	9	8	6	5
32	12	20	12	9	9	6	5	4	3	3
28	9	- 3	7	4	5	3	3	2	2	1
24	7	-37	3	2	2	1	1	1	1	
20	4	-71	1	1						

*Reading Comprehension, Arithmetic Reasoning, Arithmetic Computation, and Abstract Reasoning. Column 1 in each grade lists the percentiles derived from Project Talent Reading Comprehension, column 2 from the four combined Project Talent scores.

Inter-American General Ability and College Board Scholastic Aptitude

The General Ability, Level 5, test scores of 3019 freshmen entering the University of Texas were compared with the College Board Scholastic Aptitude scores which they had presented for admission. The intercorrelations of the subscores and totals are presented in Table 58. As would be expected, the Inter-American Nonverbal scores, which have no counterpart in the Scholastic Aptitude test, show the lowest coefficients (.28 to .42). The Verbal scores and the Total scores agree most closely (.74 and .73).

Table 58
Correlation of Inter-American Tests of General Ability, Level 5, with College Board Scholastic Aptitude Test

	Tests of General Ability			
Scholastic Aptitude	Verbal	Nonverbal	Numerical	Total
Verbal	.74	.28	.33	.56
Mathematical	.47	.45	.65	.71
Total	.69	.42	.56	.73

The coefficients of correlation are means of SAT correlations with GA-5-CE (n = 1514) and GA-5-DE (n = 1505).

Estimates of equivalent scores for the Tests of General Ability and the Scholastic Aptitude Test are listed in Table 59. This table provides data which should be useful to high school counselors and to students who are making plans for college. Although the tests have substantial differences in content, they have enough in common to justify a comparison of the scores. A student who takes the Inter-American test may find from the table, not an estimate of the score he *will* make on the Scholastic Aptitude test, but a translation into Scholastic Aptitude units of the score he *has already made* on the Inter-American test.

Table 59
Equivalent Scores: Inter-American Tests of General Ability, Level 5, and College Board Scholastic Aptitude Test

Verbal with Verbal			Numerical with Mathematical			Total with Total		
GA-5	Equiv.	SAT	GA-5	Equiv.	SAT	GA-5	Equiv.	SAT
	CE	DE		CE	DE		CE	DE
48	705	695	48	700	700	144	720	720
46	645	625	46	670	670	140	690	690
44	590	565	44	650	640	136	660	660
42	530	500	42	630	615	132	630	630
40	490	465	40	600	590	128	600	600
38	460	430	38	580	565	124	580	575
36	430	400	36	555	540	120	555	550
34	405	375	34	530	520	116	530	525
32	380	360	32	505	500	112	500	495
30	360	340	30	480	475	108	475	470
28	335	320	28	450	450	104	455	445
26	315	300	26	430	425	100	435	420
24	300	290	24	410	400	96	420	405
22	280	270	22	390	375	92	400	385
20	260	250	20	370	355	88	385	370
			18	350	340	84	365	355
			16	330	320	80	350	350
			14	315	305	76	340	340
			12	300	290	72	330	330
						68	320	320

Special Studies

Data from a number of special studies will be included in this section of the report.

The Pretest for Teaching Test Procedure

We were so sure that the Pretest would be a useful device for teaching testing procedure to children who are just entering grade 1 that we provided only a limited experiment to determine its value. But we found the situation more complicated than we had expected, and our data do not give a completely satisfying answer. The experimental design was simply to give both forms of the Test of General Ability, Level 1, with and without the Pretest (or Pre-Prueba, the Spanish edition) to comparable groups. It was thought that the use of the Pretest would lessen the difference and increase the correlation between the scores of the first and second tests. The statistical data are summarized in Table 60.

Table 60
Tests of General Ability, Level 1--Comparison of Forms CE and DE
and Forms CEs and DEs with and without Pretest

(The order of Forms C and D varied in the testing, and the groups
were not formed in such a way as to be entirely comparable.)

		Mean		Standard Deviation		Correlation of First and Second Tests
	n	First Test	Second Test	First Test	Second Test	
CE and DE						
Without Pretest	69	53.8	58.7	10.5	9.5	.768
With Pretest	69	55.4	58.9	8.7	8.3	.724
CEs and DEs						
Without Pretest	57	38.0	42.5	12.2	12.4	.884
With Pretest	58	38.9	42.2	12.9	14.3	.900

There were significant changes in the scores from test to retest (with a different form) both with and without the Pretest. The mean change in score sometimes favored one group and sometimes the other. The correlations of test and retest were not far different in the two procedures.

The testing supervisors and examiners were divided in their opinions of the value of the Pretest. It seems evident that use of the Pretest in some cases at least makes the administration of the test less difficult, just as a first test prepares children for an alternate form, but the evidence is not sufficient to justify the use of the Pretest as a routine procedure. It is probably too short to replace the first test as a preparation for the second; the better procedure to stabilize a score is to administer both forms of the test.

The Use of Parallel Tests in Teaching English as a Second Language

In the spring semester of 1963 Spanish editions of the Tests of Reading were administered to first-year and second-year students of Spanish at the University of Texas through the cooperation of Dr. Beverly J. Gibbs, Coordinator of Lower-Division Spanish and members of the teaching staff. Similarly Professor J. H. McCoy administered tests to his first-year, second-year, and third-year students at Southwestern University. At both the University of Texas and Southwestern University level 3 tests were used with first-year students and level 4 tests with second-year students. At Southwestern University, level 5 tests were used with third-year students.

In both institutions the level 3 tests were difficult for many first-year students, but at every level wide differences in scores appeared. Because of the much larger number of students tested, an analysis of the results is offered for the University of Texas only.

Intercorrelations of the scores on the Tests of Reading and the semester grades of the University of Texas students are presented in Table 61. Scores on the Tests of Reading at the 10th, 25th, 50th, 75th, and 90th percentiles, and means and standard deviations are listed in Table 62.

The correlation of the test as a whole with semester marks is approximately .50 at both the first-year and second-year levels. Scores on the English edition of the Tests of Reading, Level 5, for 29 of the first-year students were available for a correlation of the ability to read English with the ability to read Spanish, as measured by these tests. The coefficient (.76) supports the hypothesis that ability to read one's own language is an important index of ability to learn to read a second language.

Table 61
Intercorrelation of Spanish Reading Scores and Semester Grades
Spring Semester, First-Year and Second-Year Spanish, University of Texas
(Values in the table are means of two values, one from the group to which
Form CEs was administered and one from the group to which Form DEs
was administered. Semester marks: A 4, B 3, C 2, D 1, F 0.)

Spanish 407 -- L-3-CEs (n=166) and L-3-DEs (n=86).

Variable	Mean	Standard Deviation	1	2	3	4	5
1. Vocabulary	22	6.0	1.00	.55	.63	.88	.40
2. Speed of Comprehension	8	3.1	.55	1.00	.59	.75	.37
3. Level of Comprehension	21	6.2	.63	.59	1.00	.90	.51
4. Total Reading	51	13.2	.88	.75	.90	1.00	.51
5. Semester Grade	2.2	1.1	.40	.37	.51	.51	1.00
Spanish 312L -- L-4-CEs (n=96) and L-4-DEs (n=96).							
1. Vocabulary	32	5.2	1.00	.47	.50	.82	.39
2. Speed of Comprehension	13	3.7	.47	1.00	.53	.74	.51
3. Level of Comprehension	29	6.7	.50	.53	1.00	.89	.36
4. Total Reading	74	13.0	.82	.74	.89	1.00	.49
5. Semester Grade	2.2	1.0	.39	.51	.36	.49	1.00

Table 62
Tests of Reading, Spanish Edition
Administered to Students of Spanish as a Second Language
University of Texas, Spring Semester, 1963

I. First-Year Students - Lectura, Nivel 3 (CEs n = 166; DEs n = 86)

Percentile	Vocabulary		Speed		Level		Total	
	CEs	DEs	CEs	DEs	CEs	DEs	CEs	DEs
90	28	31	11	14	30.5	29	68	68
75	25	27	9	10	26	25	58	62
50	20.5	23	7	7	21.5	21	49	52
25	17.5	19	5	5	17.5	16	42	41
10	14.5	14	4	4	14	13	34	33
Mean	21	23	7	8	22	21	50	51
Standard Deviation	5.7	6.3	2.6	3.5	6.1	6.4	12.1	14.3

II. Second-Year Students - Lectura, Nivel 4 (CEs n = 96; DEs n = 96)

90	38	38	16	19	38	36	88	94
75	35	36	14	16	35	32	81	83
50	31	33	12	14	31	27	74	73
25	28	28	10	11	26	23	65	64
10	24	25	8	9	22	20	59	57
Mean	31	32	12	14	30	28	73	74
Standard Deviation	5.4	4.9	3.2	4.2	6.2	7.2	12.1	13.9

Special studies in the New York City Schools

With the cooperation of J. Wayne Wrightstone, Acting Deputy Superintendent, and Samuel D. McClelland, Acting Director of the Bureau of Educational Research, Tests of General Ability, Level 1 (first edition) and Level 2, both English and Spanish, and Tests of Reading, Level 2 (English edition), were administered under carefully controlled conditions in selected New York City Schools which enroll both English-speaking and Spanish-speaking (Puerto Rican) children. The results of the level 1 tests were presented by Mrs. Georgia T. January, Psychologist, in a 16-page mimeographed report for limited distribution (Bureau of Educational Research, "The Revised Inter-American Tests of General Ability, Primary Level 1, October 1962). Mrs. Louise Schwietert, Assistant in Research, reported less formally on the Level 2 tests. This careful experimentation deserves a much more detailed report than the partial summary which follows.

Both Form CE and Form DE of the Tests of General Ability, Level 1, were administered to 195 English-speaking pupils and both Forms CEs and DEs to 178 Spanish-speaking pupils in the first grade during November, 1961. The Spanish-speaking pupils with some exceptions were selected from those who spoke no English or spoke it only "haltingly at all times." The mean total scores are shown in Table 63.

Table 63
Mean Total Scores, Tests of General Ability,
Level 1, First Edition, New York Study

		English-speaking Pupils			Spanish-speaking Pupils	
Group	n	Form CE	Form DE	n	Form CEs	Form DEs
Boys	85	54.4	55.4	83	34.6	33.5
Girls	110	54.1	54.0	95	37.2	36.3
Total	195	54.2	54.7	178	36.0	35.0

Differences in the mean scores of boys and girls are small and not statistically significant, but differences between the English-speaking pupils and Spanish-speaking pupils are quite large. A comparison of mean scores on the subtests (Oral Vocabulary, Number, Classification, and Association) reveal only small differences between the two forms, C and D, but marked differences between the English-speaking and Spanish-speaking pupils. Both groups found the Oral Vocabulary much easier than the other subtests.

The mean test scores of pupils who were classified by the teachers as slow, average, or bright before the tests were given rise group by group with the classification. The details are shown in Table 64.

Table 64
Mean Test Scores of Pupils Grouped According to Teacher
Estimate of Intelligence, New York Study

		English-speaking Pupils			Spanish-speaking Pupils	
Rating	n	Form CE	Form DE	n	Form CEs	Form DEs
Bright	63	61.0	61.5	20	45.0	41.0
Average	93	56.0	55.9	90	36.3	36.3
Slow	38	39.2	40.8	64	32.6	31.2

A comparison of the mean total scores of the first-grade Spanish-speaking pupils grouped by ratings on their ability to speak English shows an increase in mean test score with improved ability to speak English. "The trend ... toward higher mean total scores in association with improved ability to speak English has been found in all other Bureau of Educational Research Studies of Spanish tests for Puerto Rican pupils."

Level 2 tests were administered in six schools during March, 1963—Tests of General Ability in the second grade, Forms CE and DE to English-speaking pupils and Forms CEs and DEs to Spanish-speaking pupils; Tests of Reading in the third grade, Forms CE and DE to both English-speaking and Spanish-speaking pupils. The Tests of Reading were administered to a small number of second-grade pupils also. As in the experiment with the level 1 tests, the ability to speak English no better than haltingly was a consideration in selecting the Spanish-speaking pupils.

The comments of teachers call attention to a number of points where they thought the tests might be improved. Some of the comments referred to specific items and others were more general. One of the general comments relates to the use of the customary visual symbols for multiplication and division in the written part of the Number subtest. It seems clear from comments from various sources that some second-grade children are not acquainted with these symbols and for that reason, if nothing more, cannot solve the problems presented. Another comment, also from other sources, was that the print in the Test of Reading is too small. It was pointed out, too, that the Test of Reading "was a frustrating experience for the Spanish-speaking children," because the test was too difficult for them.

The summary of the experimental testing program for the level 2 tests included tentative percentile norms (Total scores) for second-grade pupils on the Tests of General Ability and for third-grade pupils on the Tests of Reading. In addition, background data and detailed test results were submitted for the pupils included in the testing program.

Tests of Spanish-speaking Pupils in the Miami (Florida) Area

Miami, Florida, has a large concentration of Spanish-speaking children. Many of these children have come into this country only recently and because of their lack of knowledge of English present serious problems to the schools. To find how the children respond to the Spanish edition of our Tests of General Ability and Tests of Reading, the tests were administered in the spring of 1963, under the supervision of H. George Loiselle, Supervisor of Testing, to a small sample of pupils. Tests of Level 3 were administered in grade 5, Level 4 in grade 8, and Level 5 in grade 10. The pupils are grouped locally as non-independent, intermediate, and independent. The non-independent "have a great deal of difficulty understanding English and are unable to express themselves with any degree of competency." The intermediate pupils "have a greater comprehension of oral English and are able to express themselves fairly well but still make many mistakes."

The median scores of the several groups are listed in Table 65.

Table 65
Tests of General Ability and Tests of Reading
Spanish-speaking Pupils in the Miami, Florida, Area
Median Scores

I. Tests of General Ability

Test	Grade	Group	Number	Verbal	Nonverbal	Numerical	Total
HG-3-CEs	5	Non-independent	29	35	32	31	97
	5	Intermediate	20	32	33	32	98
HG-4-CEs	8	Non-independent	13	22	22	14	54
	8	Intermediate	14	29	34	21	82
	8	Independent	9	39	39	30	110
HG-5-CEs	10	Non-independent	24	21	24	14	59
	10	Intermediate	26	27	30	20	77

II. Tests of Reading

Test	Grade	Group	Number	Vocabulary	Speed	Level	Total
L-3-CEs	5	Non-independent	28	19	10	16	45
	5	Intermediate	21	18	9	14	41
L-4-CEs	8	Non-independent	18	14	8	12	34
	8	Intermediate	18	17	12	16	47
	8	Independent	9	29	18	28	71
L-5-CEs	10	Non-independent	22	28	12	18	62
	10	Intermediate	25	26	16	18	59

Testing Spanish-speaking Children of the Southwest

The home language of one child in eight in the Southwest is Spanish, but the language of the public schools in which the child enrolls is English. Since this language situation creates special problems for testing, it is pertinent to inquire whether the Spanish edition of the Inter-American Tests may not be an important addition to the tests now available.

If children know only Spanish as is true of many children who enter the first grade and of a smaller number who transfer at a higher level from a Spanish-language school, obviously the only language which can be used is Spanish. The Inter-American Tests are especially useful for these children because comparative data can be assembled by testing other children with the English edition. However, when children have had experience in English-language schools without educational opportunities in Spanish, the picture changes rapidly.

A study in the El Paso (Texas) public schools suggests that as early as the end of the second grade there may be little advantage in using Spanish rather than English in an ability test. Our Test of General Ability, Level 2, was administered to 108 Spanish-speaking children enrolled in the second semester of grade 2. The experimental design provided for a division of four class groups into groups of assumed equivalent ability by taking alternate names on the class rolls. To the a groups the English edition of the General Ability Test, Level 2 (GA-2-CE), was administered, and to the b groups of the parallel Spanish edition (HG-2-CEs). It will be recalled that the only reading and writing required in this test is the reading and writing of numbers in simple arithmetic computation.

Table 66 reveals a striking similarity of the distributions and of the median scores. Although there seems to be a tendency toward a few higher scores on the Spanish edition, it appears that in general either Spanish or English could have been used almost equally well. The results suggest that if a teacher is uncertain about the appropriate language to use, the practical solution is to give both forms, one in each of the two languages.

Table 66
General Ability, Level 2, Forms CE and CEs
Administered to "Equivalent" Halves of Grade 2

	Verbal-Numerical		Nonverbal		Total	
Score	CE	CEs	CE	CEs	CE	CEs
78-82						1
73-77						3
68-72					1	3
63-67					5	3
58-62					12	8
53-57		1			14	13
48-52		1			5	11
43-47		2			12	6
38-42	4	5			4	2
33-37	12	12	1	2	1	3
28-32	24	19	9	6		1
23-27	12	10	18	17		
18-22	2	4	17	20		
13-17			8	6		
8-12			1	3		
Total	54	54	54	54	54	54
Approximate Median	30.5	31.4	23.0	22.3	53.3	53.7
Median CEs-Median CE		+.9		-.7		+.4

Experimenting with the Inter-American Tests of General Ability, Level 4, and Tests of Reading, Level 4, in an Arizona junior high school, Dean Jensen found that his Spanish-speaking students could not "read or write Spanish at all" unless they had had it in school. He concluded that they were handicapped on most tests because they knew neither Spanish nor English well.

Both the English and the Spanish forms of the Inter-American Tests of Reading, Level 3, were administered by R. L. Wesselman to 168 Spanish-speaking children in grades 4, 5, and 6 of a Texas elementary school. The mean scores of the groups tested varied from 24 to 49 on the English edition and 11 to 19 on the Spanish edition. In contrast, the mean scores of 245 English-speaking children enrolled in the same grades of another school of the city varied from 51 to 92. The total possible score is 110.

Testing in Saltillo, Mexico

A special program of testing in Saltillo, Mexico, was supervised by Srta. Ethel Sutton, Profesora, Escuela Anexa a la Normal. La Prueba de Habilidad General, Forma DEs, was administered to first-grade children of two schools in the fall of 1962, and teachers' estimates of the quality of work of the children were obtained. Then in the following spring la Prueba de Lectura, Forma CEs, was administered to pupils who had taken the fall tests in one of the schools. La Prueba de Lectura was given also to a group of second-grade children in the same school.

The correlation of Total scores on the General Ability test and teachers' estimates of the quality of school work of 195 six- and seven-year-olds was .545 (mean of scores 50.5, standard deviation 15). The correlation of Totals on the General Ability and the Reading Tests of 91 first-grade children was .36 (means and standard deviations General Ability 59 and 11; Reading 35 and 15).

Although the mean General Ability score of pupils in one of the schools was much higher than that of the other (probably reflecting in part a difference in socio-economic status), the scores of the two were combined for tentative percentile norms. Then a scale of learning coefficients was added to express relative standing in the group. The learning coefficients were simply transformation of the raw scores into standard scores with a mean of 100 and standard deviation of 15.

Although the Verbal-Numerical subtest was too easy for the most able children, the level of difficulty of the General Ability Test as a whole seemed well adapted to the children who were tested. (Of a possible total of 80 points, the mean was 43 and the standard deviation 14 for the group of 195 children from both schools.) The Test of Reading, on the other hand, proved rather difficult for the first-grade children except the most able. (Of a possible 110 points, the mean was 35 and the standard deviation 15 for 91 children.) At the second-grade level, however, the mean score of a group of 39 children was 69 with a standard deviation of 15. The subtest Speed of Comprehension was especially difficult for less advanced readers. (Of a possible score of 30 the first-grade mean of 91 children was only 5.)

Approximate percentile scores of 195 first-grade children of ages six and seven and of the 87 six-year-olds in the combined groups are presented in Table 67.

Table 67

Tests of General Ability, Level 1, Spanish Edition, Grade 1, Saltillo

Percentiles	Total Scores	
	Ages 6 and 7	Age 6 only
90	69	67
75	63	57
50	52	49
25	39	35
10	28	23

Tests in an American School in Central America

Through the cooperation of Warren D. Jagush, Director of the Lincoln School, Institución de Cooperación Educacional, of San José, Costa Rica, Tests of General Ability were administered in grades 1 to 10 and Tests of Reading in grades 2 to 5 of an American School in Central America. Table 68 records the 10th, 25th, 50th, 75th, and 90th percentiles of the Total scores. Some of the children in grades 2 to 5 had both a General Ability Test and a Reading Test. The correlation of the two tests are listed in Table 69.

Although the numbers are small and only one school is represented, the experiment provides an introduction of the new Inter-American Series to American Schools in Central and South America and a start toward norms.

Table 68
Test Results from an American School in Central America
Fall, 1962

General Ability - Total Scores

Percentiles	GA-1-CE* or HG-1-CEs Grade 1	GA-2-CE Grade 2	GA-2-CE* or HG-2-CEs Grade 3	GA-3-CE Grade 4	GA-3-CE* or HG-3-CEs Grade 5	GA-3-CE Grade 6	GA-4-CE Grade 7	GA-4-CE Grade 8	GA-4-CE Grade 9	GA-5-CE Grade 10
90	73	81	86	119	128	138	115	132	131	120
75	72	76	83	115	124	131	108	123	128	108
50	70	70	76	99	115	122	92	116	120	97
25	65	63	71	81	104	113	64	97	106	81
10	62	57	62	63	97	95	57	90	83	58
Number	45	49	55	30	24	48	27	31	31	29

*In some cases the Spanish form was used.

Reading - Total Scores

Percentiles	R-2-CE Grade 2	R-2-CE Grade 3	R-3-CE Grade 4	R-3-CE Grade 5
90	95	92	85	103
75	85	87	66	88
50	70	70	55	70
25	56	64	38	56
10	46	57	32	43
Number	51	30	31	22

Table 69
Correlation of Reading Scores with General Ability Total Score
American School in Central America

	R-2-CE with GA-2-CE		R-3-CE with GA-3-CE	
	Grade 2	Grade 3	Grade 4	Grade 5
Reading	n = 45	n = 24	n = 27	n = 20
	r	r	r	r
Vocabulary	.51	.46	.51	.68
Speed of Comprehension	.39	.51	.59	.65
Level of Comprehension	.51	.58	.58	.76
Total	.51	.57	.62	.78

Tests of General Ability and Reading in the Republic of Panamá

Tests of General Ability, Form CEs, and Tests of Reading, Form CEs, were administered in the winter of 1962-63 to a sample population in the schools of the Republic of Panamá under the supervision of Leonarda Régis Vissuetti, Supervisora de Orientación Educativa y Nacional, Ministerio de Educación. The Tests of General Ability and Reading, Level 2, were given in grade 2, Level 3 in grade 5, Level 4 in grade 8, and Level 5 in Instituto 5th. The Primary Test of General Ability, Level 1, was administered to kindergarten children.

The correlations of the Total scores of General Ability with the part and Total scores of Reading and the correlations of the Verbal scores of General Ability with the Total scores of Reading are listed in Table 70 . The table shows some tendency for the correlation of General Ability and Reading to increase with advance in level and grade. The coefficients showing the relation of the Total scores are all above .60, and the correlation of the Verbal General Ability score with the Total Reading score rises to .78 and .79 at levels 4 and 5.

Table 70
Tests of General Ability and Reading, Form CEs, in Panamá
Correlation of General Ability Scores with Reading Scores

	Level 2		Level 3		Level 4		Level 5	
	Grade 2		Grade 5		Grade 8		Inst. 5	
Total GA Score with Test of Reading	Mean	r	Mean	r	Mean	r	Mean	r
Vocabulary	28	.63	25	.63	26	.67	32	.53
Speed of Comprehension	7	.44	12	.57	15	.60	12	.64
Level of Comprehension	19	.50	22	.62	24	.67	20	.70
Total	55	.62	59	.66	64	.73	65	.70
n	69		105		91		74	
General Ability Mean	60		91		94		70	
Verbal GA Score with Total Reading Score		.59*		.61		.78		.79
GA Verbal Mean	38*		34		35		26	

*At level 2 the GA score is Verbal-Numerical.

Percentile distributions of the Total scores of the Tests of General Ability and Tests of Reading are listed in Table 71. Although the sampling is limited, the table should provide a useful reference in further use of the tests.

Table 71
Tests of General Ability and Reading, Form CEs, in Panamá—Percentile
Distribution of Total Scores

	General Ability					Reading			
Percentile	Level 1 Kindergarten	Level 2 Grade 2	Level 3 Grade 5	Level 4 Grade 8	Level 5 Inst. 5	Level 2 Grade 2	Level 3 Grade 5	Level 4 Grade 8	Level 5 Inst. 5
90	58	73	115	118	93	77	88	87	85
75	49	68	107	107	81	64	72	77	74
50	43	61	93	96	67	56	57	65	62
25	37	53	76	81	58	45	43	54	54
10	32	46	65	70	46	30	32	40	48
n	77	69	105	91	74	69	105	91	74
Possible Score	80	100	150	150	150	110	125	125	125
Mean	43	60	91	94	70	55	59	64	65
Standard Deviation	10.1	10.3	19.3	19.4	19.0	16.3	20.7	17.8	15.2

Tests of Reading in the Schools of Venezuela

Under the supervision of Professor Francisco del Olmo, the Tests of Reading, Levels 2, 3, and 4, Spanish edition, were administered to a sampling of more than 800 pupils distributed through grades 2 to 10 of schools in Venezuela. (The first six grades in Venezuela schools are included in primary education, and the next four grades, which we have numbered 7 to 10, are grades 1 to 4 of "median" education.) Forms CEs and DEs were distributed alternately in the test administration. A summary of the scores is given in Table 72.

Although the sampling is too limited for general norms, the scores provide a start in that direction, and the experiment introduces the new Inter-American Series to Venezuelan schools.

Table 72
Tests of Reading, Spanish Edition, in the Schools of Venezuela
Percentiles of Total Scores

Percentile	L-2, Grade 2		L-2, Grade 3*		L-3, Grade 3*		L-3, Grade 4		L-3, Grade 5	
	CEs	DEs	CEs	DEs	CEs	DEs	CEs	DEs	CEs	DEs
90	61	67					37	44	56	59
75	53	58					34	38	44	51
50	44	46	59	66	19	20	28	26	34	37
25	38	39					20	17	23	25
10	26	28					16	12	18	14
Mean	44	47	59	62	18	20	27	28	35	37
St. Dev.	14.8	14.9	8.9	11.6	9.5	9.8	10.9	13.9	15.1	17.2
n	38	37	12	13	12	13	45	42	50	48

Percentile	L-3, Grade 6		L-4, Grade 7		L-4, Grade 8		L-4, Grade 9		L-4, Grade 10	
	CEs	DEs	CEs	DEs	CEs	DEs	CEs	DEs	CEs	DEs
90	78	73	62	48	46	50	69	66	82	81
75	65	68	45	32	35	38	56	52	70	71
50	50	54	34	26	28	27	42	41	55	60
25	40	42	25	21	20	23	36	32	42	46
10	31	34	16	14	13	18	28	26	33	32
Mean	53	55	35	28	28	31	46	44	56	58
St. Dev.	20.5	17.0	17.3	11.7	12.5	14.2	16.0	18.3	18.2	17.7
n	51	49	51	49	48	51	48	51	63	59

*Because of the small number only the 50th percentile is given.

Inter-American Tests in Chile

In the summer of 1963 Dr. Carl F. Hereford, Professor of Psychology, University of Chile, arranged to administer our Pruebas de Lectura, Nivel 5, to approximately 500 students in the 11th grade (5th of Humanidades) of three Santiago schools and the demonstration school of the University. The tests were administered and scored locally with the assistance of Srta. Patricie Tschorne. A tabulation of the results is presented in Table 73.

The administration of the tests in Chile provides an illustration of the interlanguage comparisons which may be made across national borders. The Total CEs score lying at the 50th percentile of the Santiago group is exactly at the 50th percentile of the CE scores in the tentative U. S. norms for the English edition estimated from the STEP Reading Test. The Santiago group was higher in Vocabulary and lower on Speed and Level of Comprehension.

Table 73
Tests of Reading, Level 5 (Spanish Edition)
Administered in Grade 11 (5th of Humanidades) of Schools of Santiago, Chile

	Vocabulary		Speed		Level		Total	
Percentiles	CEs	DEs	CEs	DEs	CEs	DEs	CEs	DEs
90	37	38	17	16	28	30	80	82
75	34	34	14	14	24	27	70	72
50	29	29	11	11	20	23	61	63
25	25	26	8	9	16	18	50	55
10	20	22	7	7	13	16	43	46

The two forms of the test were distributed alternately to students in the same groups; number CEs 250, DEs 246.

VI

CONCLUSIONS AND IMPLICATIONS

The main objective of this project has been reached. A new series of Inter-American Tests of General Ability and Tests of Reading in parallel English and Spanish editions, each in two forms, has been created and tried out in a variety of situations. The tests are tools which can be used effectively throughout this hemisphere and beyond wherever English or Spanish is spoken. They add to the present stock of tests in each language. Their unique contribution lies in their construction from materials common to two languages and two cultures, making possible a comparison of abilities across linguistic and national borders.

The Inter-American Tests are built on the assumption that good tests in English and good tests in Spanish can be built from common materials and that such tests will contribute to international cooperation in research and to the everyday work of the schools wherever a comparison of abilities in the two languages is needed. The task has only begun, however, when such instruments are made available. The interpretation of the scores in each setting must be carefully worked out. Many factors enter into the production of a score on a test, and it should not be naively assumed that a given score has the same meaning in every setting. The additional accuracy which a test gives to the observation of human traits does not simplify the complexities either of human nature or of the social situation.

Not only must a background for interpreting the tests be built through extensive experience and experimentation, but attention should be given to the technical aspects of the tests beyond that which the limited resources of the test construction project could provide. We need more evidence on the equivalence of Forms C and D and on the equivalence of the tests at different levels. We need a refinement of the values given to the several tests on the continuous scale provided for the conversion of raw scores. We need an ongoing program for improving the tests themselves and the directions for their administration.

The present project could be extended with relatively limited funds because of the left-over test materials including reusable booklets, the IBM cards containing data on thousands of tests, and the background of recent experience. A reading test for level 1 could be constructed, norms could be made more stable by additional sampling, factor analyses could be undertaken, and various improvements in the completed tests and directions could be made before the materials are published for general use. A wealth of material is available for use by students in research for advanced degrees. But these immediate possibilities are only illustrations of next steps in a program which should be extended into the years ahead with adequate support including funds for the training of future personnel. One of the handicaps of educational research is the one-shot nature of many projects which in reality should be only parts of a continuing program. In the present study we are dealing with such an area—inter-language and inter-cultural testing, cooperation with our Latin American neighbors in educational research, and improving education throughout the hemisphere.

The major problem of the moment is finding ways and means to get the tests into use. The tests will be of little value lying on the researcher's desk or even reposing in library files. The purpose of the project was primarily the construction of instruments for use and only secondarily the exploration of the general problem of inter-language testing.

The problem of getting the tests into the hands of those who could use them to advantage and of providing for continuous development of the tests is in large part a problem of organization and finance. The development and distribution of testing materials has come to be a matter of "big business" in this country. Without subsidies, the operations must be of sufficient size to finance themselves. The market for tests of general ability and reading here is strongly competitive, and in other countries it has to be developed.

As set forth in the test proposal, the tests produced in the project will be offered to Guidance Testing Associates (Austin, Texas), a nonprofit corporation formed to take over the series of Cooperative Inter-American Tests when their publication was discontinued by the Educational Testing Service. It should be said parenthetically that neither the chief investigator in this project nor any other person will receive a royalty from the tests. But the limited demand for the old Inter-American Tests suggests that there will be serious difficulties for the new tests, with a pessimistic prognosis for their survival unless substantial help can be found. The publication and promotion of the new series will require support far beyond the resources of the struggling organization to which it is offered.

We return to the problem of inter-language testing for a closing word. No one knows as yet how valuable the concept of parallel tests basic to the Inter-American Series will prove to be. The answer can be found only through experience and experiment. The old Inter-American Series and the new are offered as pioneer instruments in the hope that they will blaze the way toward more mature solutions to the problems of inter-language testing.

VII

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